Health Promotion and Chronic Disease Prevention in Canada

Research, Policy and Practice

Volume 35 · Number 8/9 · October/November 2015

Special Issue: Child Maltreatment

Child maltreatment surveillance

117 Editorial – The Canadian Incidence Study of Reported Child Abuse and Neglect: a partnership

119 A review of recent analyses of the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS)

130 Correlates of joint child protection and police child sexual abuse investigations: results from the Canadian Incidence Study of Reported Child Abuse and Neglect–2008

138 Commentary – Child maltreatment surveillance: enumeration, monitoring, evaluation and insight

Child maltreatment prevention

141 Editorial – The Nurse–Family Partnership: evidence-based public health in response to child maltreatment

143 Vulnerability within families headed by teen and young adult mothers investigated by child welfare services in Canada

151 Adapting, piloting and evaluating complex public health interventions: lessons learned from the Nurse–Family Partnership in Canadian public health settings

160 Health care and social service professionals' perceptions of a home-visit program for young, first-time mothers

168 Commentary – Adapting and retesting evidence-based child maltreatment prevention programs: a case study in Canada

171 Other PHAC publications

To promote and protect the health of Canadians through leadership, partnership, innovation and action in public health.
— Public Health Agency of Canada

Published by authority of the Minister of Health.
© Her Majesty the Queen in Right of Canada, represented by the Minister of Health, 2015
ISSN 2368-738X
Pub. 140441
Journal_HPCDP-Revue_PSPMC@phac-aspc.gc.ca

Également disponible en français sous le titre : *Promotion de la santé et prévention des maladies chroniques au Canada : Recherche, politiques et pratiques*

Submission guidelines and information on article types are available at: http://www.phac-aspc.gc.ca/publicat/hpcdp-pspmc/authinfo-eng.php

Indexed in Index Medicus/MEDLINE, SciSearch® and Journal Citation Reports/Science Edition

Public Health Agency of Canada | Agence de la santé publique du Canada

Canada

Editorial

The Canadian Incidence Study of Reported Child Abuse and Neglect: a partnership

Lil Tonmyr, PhD, Guest Editor

Tweet this article

Child maltreatment is a public health issue of great importance. It is also a complex issue to define, identify and respond to. Views differ regarding families' rights to self-determination versus children's rights to protection from harm. Conflicting value systems and perceptions give rise to spirited public and legal debate. Child welfare agencies, mandated to protect children from harm, are criticized for inappropriately interfering in some situations and not intervening quickly enough in others.

Although child welfare agencies have the primary task of protecting children from harm in Canada, roles and responsibilities often involve social welfare, health, education, justice and law enforcement personnel. Child welfare legislation is a matter of provincial and territorial jurisdiction, and services are delivered through municipal and/or regional organizations. Child welfare services to First Nations children living on reserve are funded by Aboriginal Affairs and Northern Development Canada, either through First Nations child and family agencies or provincial and territorial governments' services where no First Nations agencies exist.

Although there have been advances in understanding child maltreatment, this field is relatively new: although the effects of physical abuse on children came to widespread attention in the 1960s, it was not until the next decade that their association with mental health problems was recognized. To date, little research has been conducted on possible long-term physical consequences of child maltreatment, such as chronic conditions and diseases. Studies based on Canadian data are particularly rare, especially in the area of intervention research.

A child maltreatment surveillance system provides a crucial tool to help address some of these complexities. It establishes consistent definitions of forms of child maltreatment (neglect, exposure to intimate partner violence, emotional maltreatment, physical and sexual abuse). It provides data for everyone involved in the response to understand the situation, and monitor and adapt programs and policies to better address the identified needs.

In the mid-1990s, Health Canada's Family Violence Prevention Unit commissioned a study to assess the possibility of collecting child maltreatment data from child welfare agencies across Canada. A Health Canada group responsible for maternal and child health surveillance built on the results of this study. This group consulted widely with provincial and territorial partners to build a surveillance system, resulting in a truly collaborative effort that led to the implementation of the *Canadian Incidence Study of Reported Child Abuse and Neglect* (CIS).[1,2] This was a remarkable accomplishment considering the challenge of working with multiple partners, different legislative frameworks and the stigma that often accompanies the experience of child maltreatment.

The CIS captures data on child maltreatment investigations conducted by child welfare workers across Canada as well as the health and socioeconomic issues facing caregivers and children. In addition, it provides information about the systems' response to the child's plight.

Data collection for the CIS started in 1998[3] and continued in 2003[4] and 2008.[5] Since 2004, the CIS continued as a surveillance system under the Public Health Agency of Canada. Preparation for CIS–2018 is ongoing.

CIS has always been dynamic and has constantly improved between cycles. Refining the measures of physical abuse and emotional maltreatment was one of the improvements introduced in 2003. Work spearheaded by Dr. B. Fallon, one of the key CIS researcher–collaborators of the CIS, led to the 2008 introduction of investigations of risk of future child maltreatment.[6] Furthermore, numerous studies using CIS data have been used to inform policy and make decisions about best practices.[7,9] CIS utility continues to be highly valued by policy makers and researchers.

It is with great pleasure that I introduce this section of the special issue of *Health Promotion and Chronic Disease Prevention in Canada: Research, Policy and Practice*, which is dedicated to the CIS, a key component of the Public Health Agency of Canada's surveillance programs. This is the first part of the special issue on child maltreatment; the second section highlights child maltreatment prevention with special attention to the Nurse–Family Partnership (NFP). The invited commentary of the second section describes Canada as testing the NFP's effectiveness outside of the United States.[10]

Author reference:

Surveillance and Epidemiology Division, Public Health Agency of Canada, Ottawa, Ontario, Canada

Correspondence: Lil Tonmyr, Surveillance and Epidemiology Division, Public Health Agency of Canada, 785 Carling Avenue, AL 6807B, Ottawa, ON K1A 0K9; Tel: (613) 240-6334; Email: Lil.Tonmyr@phac-aspc.gc.ca

This section focusses on child maltreatment surveillance:

- The first article reviews recent findings stemming from peer-reviewed analysis of the CIS and provincial and territorial data. Potter et al.[11] found that the quantity and quality of analysis continues to improve. They discovered that "newer" forms of child maltreatment such as neglect, exposure to intimate partner violence and emotional maltreatment have garnered more attention in recent years.
- The second article emphasizes that sexual abuse is an issue that requires multidisciplinary collaboration to resolve. For instance, joint investigations between child welfare and police are used as an upstream approach to enable better health outcomes for victims. Tonmyr and Gonzalez[12] portray the characteristics of these investigations as captured in the CIS.
- The invited commentary, by Drs. Leeb (Centers for Disease Control and Prevention) and Fluke[13] (University of Colorado), provides international context to child maltreatment surveillance.

The CIS has proven to be an important surveillance and research tool. It provides important information about the children and families investigated by child protection services as well as a snapshot of the occurrence of child maltreatment in Canada at a specific time based on cross-sectional data. To follow a sample of the children in the CIS over time would provide a better understanding of long-term outcomes of child maltreatment and the systems response. Maybe this can be a future improvement?

References

1. Phaneuf G, Tonmyr L. Status Report. New research initiatives from the Child Maltreatment Division. Chronic Dis Can.1998; 19(2):71-2.

2. Choi BC, Wigle DT, Johansen H, et al. Status Report Retracing the history of the early development of national chronic disease surveillance in Canada with a focus on the Laboratory Centre for Disease Control (LCDC) 1972-2000. Health Promot Chronic Dis Prev Can. 2015;35(2):35-44.

3. Trocmé N, MacLaurin B, Fallon B, et al. Canadian Incidence Study of Reported Child Abuse and Neglect: final report. Ottawa (ON): Minister of Public Works and Government Services Canada; 2001.

4. Trocmé N, Fallon B, MacLaurin B, et al. Canadian Incidence Study of Reported Child Abuse and Neglect – 2003: Major findings. Ottawa (ON): Minister of Public Works and Government Services Canada; 2005.

5. Public Health Agency of Canada. Canadian Incidence Study of Reported Child Abuse and Neglect 2008: Major findings. Ottawa (ON): Public Health Agency of Canada; 2010.

6. Fallon B, Trocmé N, MacLaurin B, Sinha V, Black T. Untangling risk of maltreatment from events of maltreatment: an analysis of the 2008 Canadian Incidence Study of Reported Child Abuse and Neglect (CIS-2008) Int J Ment Health Addiction. 2011;9:460-79.

7. Tonmyr L, Martin WK. How has child maltreatment surveillance data been used in Canada? Health Res Policy Syst. 2014;12 (1):65:1-9.

8. Tonmyr L, Jack SM, Brooks S, Williams G, Campeau A, Dudding P. Utilization of the Canadian Incidence Study of Reported Child Abuse and Neglect in child welfare agencies in Ontario. Chronic Dis Inj Can. 2012;33(1):29-37.

9. Tonmyr L, Ouimet C, Ugnat AM. A review of findings from the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS). Can J Public Health. 2012;103(2):103-12.

10. Mikton C. Commentary. Adapting and retesting evidence-based child maltreatment prevention programs: a case study in Canada. Health Promot Chronic Dis Prev Can. 2015;35(8/9):168-70.

11. Potter D, Nasserie T, Tonmyr L. A review of recent analyses of the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS). Health Promot Chronic Dis Prev Can. 2015;35(8/9):119-29.

12. Tonmyr L, Gonzalez A. Correlates of joint child protection and police child sexual abuse investigations: results from the Canadian Incidence Study of Reported Child Abuse and Neglect-2008. Health Promot Chronic Dis Prev Can. 2015;35(8/9):130-7.

13. Leeb R, Fluke J. Commentary. Child maltreatment surveillance: enumeration, monitoring, evaluation and insight. Health Promot Chronic Dis Prev Can. 2015;35(8/9):138-40.

A review of recent analyses of the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS)

D. Potter, MA; T. Nasserie, MPH; L. Tonmyr, PhD

This article has been peer reviewed.

Tweet this article

Abstract

Introduction: The objective of this analysis is to identify, assess the quality and summarize the findings of peer-reviewed articles that used data from the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS) published since November 2011 and data from provincial oversamples of the CIS as well as to illustrate evolving uses of these datasets.

Methods: Articles were identified from the Public Health Agency of Canada's data request records tracking access to CIS data and publications produced from that data. At least two raters independently reviewed and appraised the quality of each article.

Results: A total of 32 articles were included. Common strengths of articles included clearly stated research aims, appropriate control variables and analyses, sufficient sample sizes, appropriate conclusions and relevance to practice or policy. Common problem areas of articles included unclear definitions for variables and inclusion criteria of cases. Articles frequently measured the associations between maltreatment, child, caregiver, household and agency/referral characteristics and investigative outcomes such as opening cases for ongoing services and placement.

Conclusion: Articles using CIS data were rated positively on most quality indicators. Researchers have recently focussed on inadequately studied categories of maltreatment (exposure to intimate partner violence [IPV]), neglect and emotional maltreatment) and examined factors specific to First Nations children. Data from the CIS oversamples have been underutilized. The use of multivariate analysis techniques has increased.

Keywords: child maltreatment, child abuse, public health surveillance

Key findings

- In this review of 32 peer-reviewed published articles, the majority were of high quality with clearly stated research aims, appropriate control variables, appropriate analyses, sufficient sample sizes, appropriate conclusions and relevance to practice or policy.
- Researchers using CIS data have recently focussed on inadequately studied categories of maltreatment, including exposure to intimate partner violence, neglect and emotional maltreatment, and have examined factors specific to First Nations children.
- The use of complex multivariate analysis methods has recently increased.

Introduction

The Canadian Incidence Study of Reported Child Abuse and Neglect (CIS) has been completed for three cycles—1998,[1] 2003,[2] and 2008[3]—and has provided a wealth of information on investigations of reported child abuse and neglect nationwide.[4] The CIS collects data about children who have been reported to child welfare agencies because of allegations of maltreatment.[1-3] CIS data can be used as a source of information about children who have experienced alleged and substantiated neglect, exposure to intimate partner violence (IPV), emotional (or psychological) maltreatment, physical abuse and/or sexual abuse. It includes information on the characteristics of the child, caregiver, household and investigating agency as well as short-term service outcomes such as placement. CIS data is used by senior child welfare decision makers to help determine resource allocation, identify at-risk populations, understand reported maltreatment trends, validate findings at individual agencies and direct changes in practice.[4] It is also accessed by a broad range of experts in clinical medicine, public health, social work, law and justice, education, sports, recreation, and faith-based groups.[5]

The CIS–2008: Major Findings report[3] details the breadth and scope of the CIS. Each cycle of the CIS contains information on a large sample of maltreatment cases reported to child welfare agencies and opened for investigation. Child welfare workers in selected agencies across Canada completed the CIS survey for each investigation they completed within a three-month data collection period in the fall of the survey year. The participating child welfare workers were given definitions of maltreatment to ensure consistency. A multistage stratified clustered sample from all provinces and territories that included mainstream and First Nations agencies was used. Some provinces and territories provided additional funding to the CIS to obtain data (i.e. oversample) from their respective jurisdictions.

Author reference:

Surveillance and Epidemiology Division, Public Health Agency of Canada, Ottawa, Ontario, Canada

Correspondence: Lil Tonmyr, Surveillance and Epidemiology Division, Public Health Agency of Canada, 785 Carling Ave, Ottawa, ON K1A 0K9; Tel: 613-240-6334; Fax: 613-941-6439; Email: Lil.Tonmyr@phac-aspc.gc.ca

The CIS–2008 study differs from the CIS–1998 and 2003 waves because investigations of risk of future maltreatment were tracked separately from investigations of allegations of specific maltreatment. In addition, definitions of maltreatment have evolved over time. For example, the CIS–2008 tracked three subtypes of exposure to IPV: indirect exposure to physical violence, direct exposure to physical violence and exposure to emotional violence.[6] Previously, the CIS captured IPV as a subtype of emotional maltreatment. Differences between provincial and territorial legislation and changes in detection, reporting and investigation procedures over time also influence the CIS findings. This means that changes in estimates may not represent actual changes in the occurrence of maltreatment.

An earlier review[7] summarized and critically assessed 37 peer-reviewed analyses of CIS data published before November 2011. Roughly half of the sources were descriptive and half were multivariate. The review assessed the quality of the articles and found the multivariate articles to be generally of good quality; stronger evidence was provided for their objectives compared to the descriptive articles. The review recommended that future research use clear directional hypotheses and multivariate techniques.[7]

Considering the cyclical nature of the CIS, and especially because the Public Health Agency of Canada decided not to collect data in 2013, this is an opportune time to update the findings from the previous review and ask questions about the relevance of the CIS in terms of policy and practice. Only 3 of the articles in the previous review[7] utilized data from CIS–2008. In addition, the information was limited because the data had only recently been released. Furthermore, the previous review[7] was critiqued for not including results stemming from oversampling provinces. As more articles utilizing these and earlier waves of data have since been published, our review focusses on CIS-related literature published after November 2011 and analyses of CIS oversample data published at any time.

Knowledge users (decision makers and policy makers) find effectively summarized research useful. The surveillance reports stemming from the CIS have been used as a reference to obtain information quickly.[4] Similarly, we hope that this review will provide a quick reference for topics that have been analysed using the CIS data as well as on the quality of these articles. This review may also inspire researchers to further knowledge about child maltreatment and the responses of child welfare agencies. The information may also serve to improve the CIS as a surveillance tool by identifying some gaps in data collection and analysis. Lastly, the information has the potential to increase awareness of this important public health issue.

The specific objectives of this review were to

- identify and retrieve all peer-reviewed studies published between November 2011 and the present day that used CIS data or CIS provincial and territorial oversampling data collected since the inception of the study;
- assess the quality of those studies;
- summarize the findings of those studies; and
- illustrate the evolving uses of CIS data.

Methods

We included original research published in peer-reviewed journals as these can be expected to be of the highest quality and include sufficient information on methods and analyses to assess quality. Other sources, such as book chapters and presentations, may not follow a standardized format of presenting information or have specific objectives or hypotheses to test. As such, our quality assessment tool would not be suited to them. In addition, because the review is restricted to peer-reviewed journal articles, interested readers should find it easier to locate and access our primary sources. Table 1 lists all survey waves of the CIS, jurisdictions that oversampled and First Nations samples.

Articles were identified through the Public Health Agency of Canada data request records. In addition, we conducted a search for articles published by authors from the CIS research team to ensure completeness. As members of the research team did not need to request permission to use CIS data, their publications would not be captured in data request records.

Figure 1 summarizes the article selection strategy (source, inclusion and exclusion criteria) and presents the list of quality assessment questions. The quality assessment questions were the same as those used in the previous review of CIS data[7] (discussed above). Two raters independently reviewed each article for inclusion and completed the quality appraisal tool for each. Discrepancies in ratings of the articles were discussed until consensus was reached or after discussion with a third rater. Raters did not review articles they had authored.

Results

A total of 32 studies were identified for inclusion. Of those, 20 were considered multivariate and 12 descriptive; 24 used national level data and 8 provincial or territorial level data; 5 analyzed data from Quebec and 3 from Ontario; 1 used data from the First Nations component of the CIS–2008.

TABLE 1
CIS, CIS oversamples and First Nations studies

Population	Cycles
Canada	1998, 2003, 2008
British Columbia	1998, 2008
Alberta	2003, 2008, 2013
Saskatchewan	2008
Ontario	1993, 1998, 2003, 2008, 2013
Quebec	1998, 2008, 2014
Northwest Territories	2003
First Nations	1998, 2003, 2008

Table 2 shows the objectives, methods and quality assessment results of the included studies. Ninety-one percent of authors clearly described their research aims. In contrast, only 40% clearly defined all variables. Seventy-two percent of the studies provided clear inclusion criteria for cases and 72% described clear and appropriate sampling methods. Seventy-eight percent of analyses were considered appropriate to the authors' research questions. The number of participants was considered sufficient 91% of the time. Analytical procedures and results were usually clearly explained (72%) and presented (75%). Eighty-one percent of conclusions were considered appropriate, and all but one study was judged to have been about a topic with clear applications for practice or policy.

The objectives of 28% of the articles were to do with particular types of maltreatment. Two were about neglect, three about emotional maltreatment, and two about exposure to IPV. One study was about exposure to IPV, hitting or neglect as sole concerns for investigation. None of the studies had objectives exclusively to do with physical abuse. One paper examined the frequency of joint police and child welfare investigations of sexual abuse cases compared with other maltreatment cases.

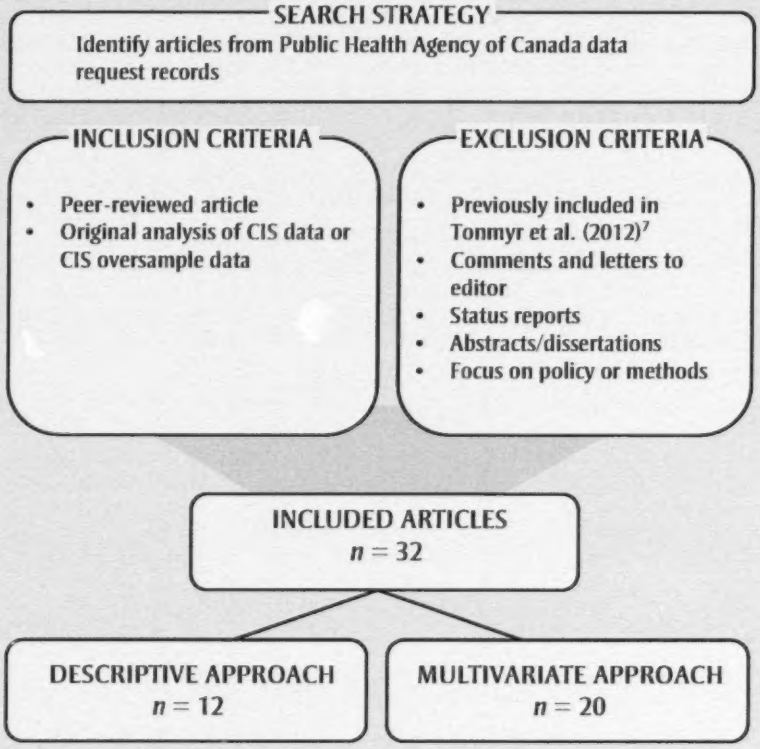
Table 3 summarizes the associations between independent, control and dependent variables measured in the articles presenting multivariate analyses. In this review, we define multivariate analyses as those that simultaneously measure multiple independent and/or dependent variables. For articles that described multiple models, only the final model is included for each dependent variable tested.

Independent and control variables are grouped into five categories: maltreatment characteristics, child characteristics, caregiver characteristics, household characteristics and agency/referral characteristics. One article that used multivariate techniques was not included in the table because the analyses were classification and regression trees that could not be easily summarized in the structure of the table.

Most analyses that used maltreatment types (i.e. physical abuse, sexual abuse, neglect, emotional maltreatment and exposure to IPV) as independent variables included more than one maltreatment type. One study included only maltreatment variables representing different types of exposure to IPV, one included only physical abuse and two included only neglect. In addition, two studies considered emotional maltreatment as a dependent variable.

FIGURE 1
Search strategy and article appraisal

a) Search strategy for articles containing analyses of the CIS and CIS oversample data



b) Critical appraisal questions

Topic
1. What is the research question?
2. Are the aims of the research clear?

Methods
3. Are clear definitions used for variables?
4. Are eligibility and exclusion criteria clearly stated?
5. Is the sampling strategy used for the study clear/appropriate?
6. Are the right analyses used to answer the research question?
7. Is the number of participants sufficient?

Findings/Conclusions
8. Is it clear how the data were analyzed?
9. Are the results clearly presented?
10. Do researchers take into account/discuss potential confounding factors?
11. Are the conclusions drawn supported by the study results?
12. Is the topic of the study relevant for practice/policy?

TABLE 2
Characteristics of articles analyzing CIS and CIS oversample data

Ref. & CIS year	Topic	Sample size (N)	Methods	Research aims clear	Variable definitions clear	Inclusion criteria clear	Sampling appropriate	Analyses appropriate	# of participants sufficient	Analysis procedures clear	Results clearly presented	Confounds addressed	Conclusions appropriate	Relevant to practice/ policy
(8) CIS–2008	To explore the distribution of child and household characteristics for substantiated single and multiple maltreatment types, to measure whether a specific type of maltreatment is associated with greater risk of functional impairment, and to identify child and household characteristics associated with functional impairment.	7352	Generalized mixed models	+	+	+	+	+	+	+	+	-	+	+
(9) CIS–1998, CIS–2003	To identify clinical and organizational factors (e.g., proportion of Aboriginal reports) that influence the decision to place a child in care after a child maltreatment investigation.	2059	Logistic regression	+	-	+								+
(10) CIS–2003	To identify factors that predict membership in different categories of emotional maltreatment and other forms of maltreatment.	11 562	Logistic regression	-	-	+	+	+	+	+	+	+	+	+
(11) EIQ–1998	To increase understanding of emotional maltreatment cases investigated in Quebec.	1778	Chi-square, ANOVA	+	+			+	+	+	+	+	+	-
(12) EIQ–1998	To identify the needs of children reported to child protective services for substantiated reasons and identify profiles of children.	2079	Cluster analysis	+	-	+	+	+	+	+	+	+	+	+
(13) CIS–1998, CIS–2003	To measure the influence of clinical and organizational characteristics on the decision to place Aboriginal children in out-of-home placements upon the conclusion of an investigation.	2039	Logistic regression	+		+		+	+	+	+	+	+	+
(14) CIS–2008	To further explore the finding that the proportion of investigations of Aboriginal children is associated with placement for all children in an agency.	1710	Multi-level logistic regression	+	+	+	+	+	+	+	+	+	+	+
(15) CIS–2008	To identify the profile of young parents referred to child welfare, and the factors that determine service provision for these referrals.	5222	Logistic regression	+		+	+	+	+	+		+	+	+
(16) CIS–2008	To identify the factors that determine the provision of services at the conclusion of investigation for investigated children under one year of age.	1203	Logistic regression, Classification and regression trees	+	-	+	+	+	+	+	+	+	+	+
(17) CIS–2008	To identify the factors that predict service provision at the end of a maltreatment-related investigation involving infants.	530	Classification and regression trees	+		+		+	+				+	+
(18) CIS–2008	To explore profiles of families and children across investigations for maltreatment and risk of maltreatment.	11 925	Logistic regression	+	-	+	-	+	+	-	+	+	-	+
(19) CIS–2008	To describe the profile of adolescents reported to child welfare.	15 960	Logistic regression	+	+	+	+	+	+		+	+	+	+
(20) CIS–2003	To measure the relationship between child functioning concerns and contextual, parent, parenting, and child characteristics.	1170	Logistic regression	+	-	+	-	-	+	+	+	-	+	+
(5) CIS–2008	To examine the assessment of risk factors and child functioning concerns by child welfare workers and their relation to subtypes of exposure to IPV.	2184	Logistic regression	+	+	+	+	+	+	+	+	+	+	+
(21) CIS–2003, CIS–2008	To describe families with teen mothers (18 or younger) and young adult mothers (19-21) in terms of modifiable risk factors and compare them to mothers aged 22 years and older.	6836	Chi-square	+	+	+	+	+	+	+	+	-	+	+
(22) CIS–2008	To identify the factors that predict the decision to provide services after a child maltreatment report.	15 000	Logistic regression		+			+	+	+	+	+	+	+
(23) CIS–2003	To identify the frequency of reports by educators compared with other professionals, to identify the type of risk factors present in cases reported by educators, and to determine whether differences in case characteristics reported by educators account for differences in investigation outcomes.	7725	Logistic regression	+	+	+	+	+	+	-	+	+	+	+
(24) CIS–2003	To describe characteristics of Asian children, families, and households in the Canadian child welfare system and to examine short-term service provision or transfer to ongoing services.	1790	Logistic regression	+	+	+	+	+	+	+	+	+	+	+
(25) CIS–2008	To provide updated profile of substantiated IPV investigations and examine the differences between IPV investigations and other investigations.	15 890	Chi-square	+	-	-	+	-	+	+	+	-	+	-
(26) CIS–2008	To examine case characteristics and service disposition for investigations of children with non-Aboriginal primary caregivers who speak neither English nor French as their primary language.	10 334	Logistic regression	+				+	+	+	+	+		+
(27) EIQ–1998	To identify factors that predict maltreatment or behavioural problems.	2232	Logistic regression	+	-	+	+	+	+	+	-	+	+	+

Continued on the following page

TABLE 2 (continued)

Characteristics of articles analyzing CIS and CIS oversample data

Ref. & CIS year	Topic	Sample size (N)	Methods	Research aims clear	Variable definitions clear	Includan criteria clear	Sampling appropriate	Analyses appropriate	# of participants sufficient	Analysis procedures clear	Results clearly presented	Confounds addressed	Conclusions appropriate	Relevant to practice/ policy
(28) EIQ–1998	To examine different family structures in substantiated cases of child neglect and their associated characteristics, and to compare maternal and paternal single parent families.	1778	Chi-square	+	+	+	+	+	.	+	+	.	+	+
(29) CIS–2008	To identify the prevalence of supervisory neglect and physical harm and explore characteristics related to it.	4155	ANOVA, Chi-square	+	+	+	+	+	+	+	+	.	+	+
(30) CIS–2008, FNCIS–2008	To describe the level and nature of the over-representation of First Nations children in child welfare investigations, including information on referral sources, risk factors, and child functioning concerns.	15 346	Bivariate analyses	+	+	+	+	.	.	.	+	.	.	+
(11) CIS–2008	To identify factors associated with joint investigations by police officers and child welfare workers.	11 017	Multiple logistic regression	+	+	+	+	+	+	+	+	+	+	+
(32) EIQ–1998	To describe the similarities and differences between Aboriginal and non-Aboriginal cases of maltreatment reported to Youth Protection services in Quebec.	430	Logistic regression	+	.	+	.	.	+	.	.	+	.	+
(33) CIS–2008	To examine whether exposure to IPV, hitting, or neglect as sole concerns require a traditional protection response, or a family support response.	11 017	Chi-square	+	+	+	+	+	+	+	+	+	+	+
(34) CIS–1998, CIS–2003, CIS–2008	To measure differences in response to emotional maltreatment vs. other maltreatment and whether a more specific categorization system for emotional maltreatment can differentiate between maltreatment and family problems.	30 972	Chi-square, T-tests	.	.	.	+	+	+	+	.	.	.	+
(35) CIS–1998, CIS–1998	To identify what is responsible for changes in the rates of reported and substantiated maltreatment between 1993 and 1998.	3500	T-tests	+	+	+	+	+	+	+	+	+	+	+
(36) CIS–1998, CIS–2003, CIS–2008	To explore the difference between risk and harm in the context of child welfare.	35 214	Chi-square, T-tests	+	+	.	.	+	+	+	+	.	+	+
(37) CIS–1993	To assess the incidence and characteristics of reported maltreatment, the major forms of maltreatment investigated, child and family characteristics, and outcomes of investigation.	2447	Percentages	+	.	.	.	.	+	.	+	.	.	+
(38) CIS–2008	To evaluate whether there is a specific impact of delinquency/ youth criminal justice involvement on decisions to transfer cases to ongoing services above other functioning issues.	7842	Logistic regression	+	.	.	+	+	+	+	.	+	+	+

Abbreviations:CIS, Canadian Incidence Study of Reported Child Abuse and Neglect; EIQ, Quebec Incidence Study of Reported Child Abuse and Neglect; FNCIS, First Nations Component of the Canadian Incidence Study of Reported Child Abuse and Neglect; IPV, intimate partner violence; OIS, Ontario Incidence Study of Reported Child Abuse and Neglect.

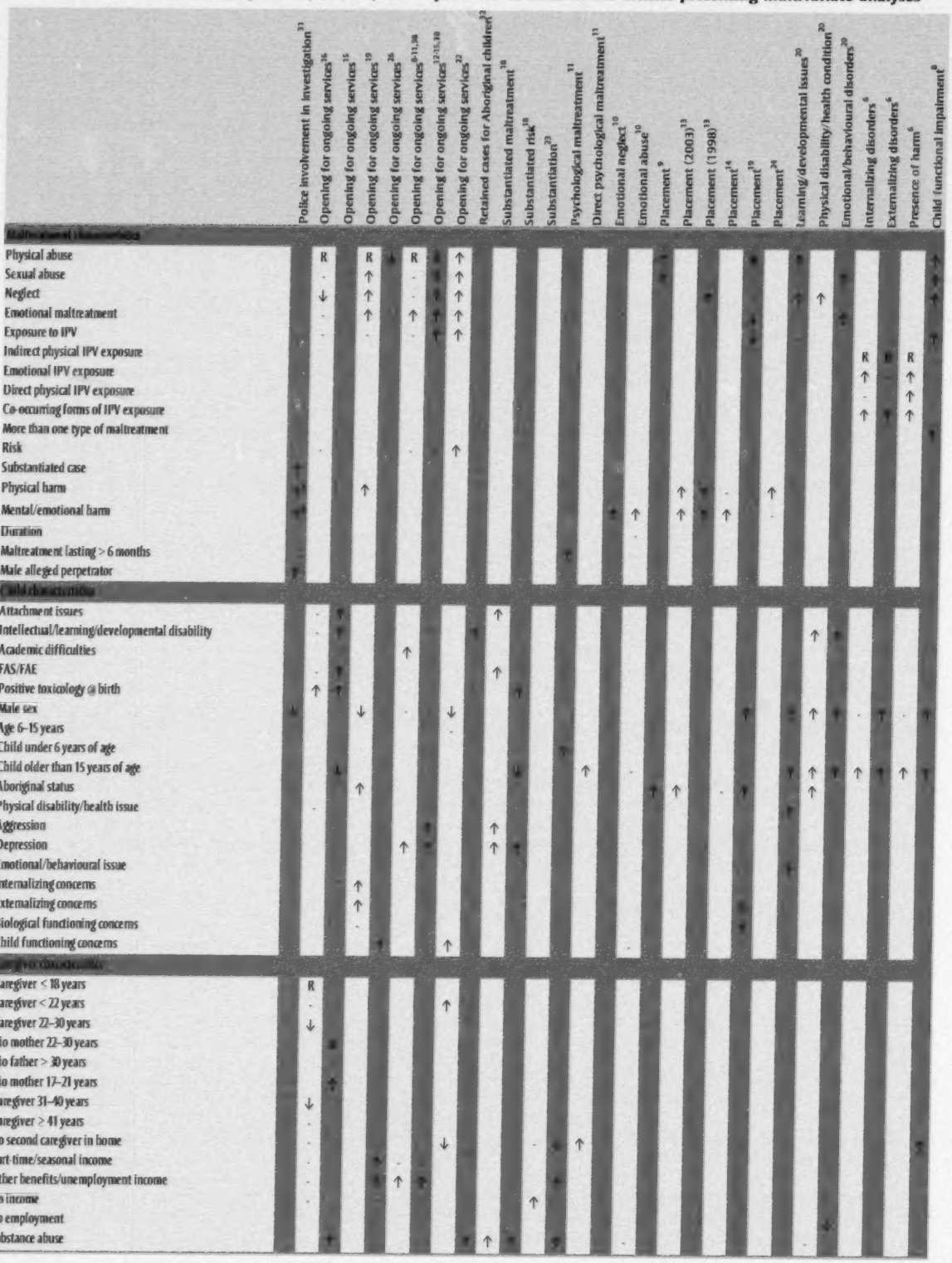
Researchers frequently used child age and sex as independent or control child-related variables. They tended to use some but not all the variables associated with child functioning concerns in their models, sometimes grouping all child functioning concerns together to create one dichotomous variable representing the presence of any of these concerns. The child functioning concerns span physical, mental, behavioural and developmental problems. Caregiver risk factors, especially substance abuse, mental health issues and lack of social support, were the most frequently used caregiver variables. Household hazards, overcrowding, household frequently runs out of money and frequency of moves were the most commonly used household variables. Finally, one or more case openings and a mother or parent as referral source were the most studied agency/referral variables.

The most commonly studied type of dependent variable, used in six articles, was the opening of a case for ongoing services. Researchers measured the associations of a variety of independent and control variables to do with maltreatment and child, caregiver, household and agency/referral characteristics with this outcome variable. The second most commonly studied outcome variable, used in four articles, was placement in out-of-home care. These articles included numerous variables to do with maltreatment, child, household and agency/referral characteristics. However, only two of four articles were about caregiver risk factors and those used few variables from the category. Other outcome variables that were studied, each in three or fewer articles, included retained cases for Aboriginal children, substantiated maltreatment, substantiated risk of maltreatment, emotional maltreatment, harm to the child, and child functioning concern variables including learning/developmental issues, physical disability/health conditions, emotional/behavioural problems, internalizing disorders, externalizing disorders, child functional impairment and police involvement in investigations.

Discussion

Our review summarized findings from the 32 identified articles on the quality and the relationships between variables in

TABLE 3
Associations between independent, control, and dependent variables in the articles presenting multivariate analyses



Continued on the following page

TABLE 3 (continued)

Associations between independent, control, and dependent variables in the articles presenting multivariate analyses

	Police involvement in investigation[31]	Opening for ongoing services[16]	Opening for ongoing services[15]	Opening for ongoing services[19]	Opening for ongoing services[26]	Opening for ongoing services[6-11,18]	Opening for ongoing services[12-15,18]	Opening for ongoing services[22]	Retained cases for Aboriginal children[32]	Substantiated maltreatment[10]	Substantiated risk[10]	Substantiation[23]	Psychological maltreatment[17]	Direct psychological maltreatment[17]	Emotional neglect[20]	Emotional abuse[18]	Placement[9]	Placement (2003)[13]	Placement (1998)[13]	Placement[14]	Placement[19]	Placement[24]	Learning/developmental issues[23]	Physical disability/health condition[20]	Emotional/behavioural disorders[20]	Internalizing disorders[6]	Externalizing disorders[6]	Presence of harm[6]	Child functional impairment[8]
Cognitive impairment			↑							↑	↑		↑			-									↑		↑	
Mental health issues			↑							↑	↑		↑			-									↑		↑	
Physical health issues			↑											↑									↑						
Few social supports			↑					↑		↑	↑											-			↑	↑	↑	↑	
Marital conflicts													↑																
Victim of domestic violence										↑	↑													↑					
Perpetrator of domestic violence											↑																		
Caregiver functioning/risk factors		↑		↑	↑	↑	↑	↑																					
Ethnic minority								-														↑							
Asian ethnicity																						-							
Non-English/Non-French primary language																						↑							
Form of punishment																						-							
Parent uses spanking													↑																
Parent maltreated as a child																													
Household characteristics																													
> 1 child in the home									↑																			↑	
Household overcrowded				↑		↑																						↑	
Min one household hazard		↑	↑	↑	↑					↑	↑	↑									↑							↑	
Household level of cooperation																	↓	↓		↓									
Household regularly runs out of money		-	↑	↑				↑		↑						-												↑	
Owned home																													
Rental						↓																							
Public housing						-			↑							↓													
Other/unknown housing						-			↑																				
Household receives social assistance				↑																↑								↑	
One or more moves		↑		↑[c]	↑	↑	↑	↑		↑↓	↑	↓		↑					↑									↑	
Agency/referral characteristics																													
Other/anonymous referral										↓												↓							
Referral by school									↑																				
Referral by mother/parent				-					↑																				
Regular/emergency service																													
Unknown/regular service																					↑	↑							
≥ 1 previous case openings				↑		↑	↑							↑	-														
Case opened for ongoing services															↓														
Referral to parenting program															-														
Referral to drug/alcohol counselling															↑														
Referral to psychiatric/psychological services															-														
Any other referral														↓	-														
Metropolitan location								-																					
1/5 Aboriginal reports								-																					
Proportion of Aboriginal reports																				↑									
45% + investigations Aboriginal families																			↑										
Degree of centralization																				↑									
Government run agency																				-									
Government run x Proportion of Aboriginal reports																													
Minimum education of investigator																													

Abbreviations: FAE, fetal alcohol effects; FAS, fetal alcohol syndrome; IPV, intimate partner violence; R, reference group; -, no statistically significant relationship ($p > .05$); ↓, statistically significant negative relationship ($p < .05$); ↑, statistically significant positive relationship ($p < .05$).

Note: Where more than one symbol appears in a cell, that article featured finer grained categories of the variable in question which have been collapsed forrncision and those finer categories had different relationships with the dependent variable.

[a] This variable combined physical and emotional harm.

[b] This variable combined physical and emotional harm.

[c] This variable was two or more moves.

peer-reviewed journal articles using CIS data published since November 2011 and CIS oversample data. The majority of the reviewed articles had clearly stated research aims, used appropriate control variables (where studies were multivariate rather than descriptive), conducted appropriate analyses with sufficient sample sizes, had appropriate conclusions and were relevant to practice or policy.

The majority of the studies did not clearly define variables or provide rationales for the inclusion of the variables within analyse. Because most studies included a large number of variables, this may have been due to word limits imposed by publishers rather than a lack of planned rationale by the researchers. Often articles were judged to have unclear inclusion criteria and sampling methods when the authors had not explained how they selected cases for analysis from the full CIS sample and had provided only an overview of the CIS sampling methods. When the number of participants was considered insufficient, the researchers had usually used smaller subsamples of CIS cases for analysis. One strength of the CIS is that the sample size is large enough to conduct complex multivariate analyses, which is likely why this quality indicator was almost always rated positively. Analyses were frequently appropriate and results clearly presented; however, when they were not, it was usually because authors did not describe which analyses they were performing or did not clearly label tables. When analyses were gauged to be inappropriate to the research question, it was often because researchers used univariate analyses when multivariate approaches would have better addressed their research objectives. Studies that were multivariate in nature nearly always used appropriate control variables to account for potential confounding. Other studies used descriptive analyses to explore new topics, so that hypotheses could be generated and more sophisticated techniques could be used in future research. Conclusions were judged to be inappropriate when they extended beyond the scope of the analyses, such as when authors used causal language to describe an association. When an article was judged to be limited in relevance to practice or policy it was because the application of the findings was not clearly expressed, not necessarily because it had no potential application.

Regarding the associations between variables, some articles explored issues to do with substantiating maltreatment and service provision across the full sample of specific CIS waves or provincial subsamples, whereas other articles were concerned with analyses of subgroups of investigations classified by specific characteristics of children and families or specific characteristics of the investigated maltreatment or risk of maltreatment. Analyses tended to include child maltreatment types as variables when predicting opening for services, placement and child functioning concerns or harm but not when predicting substantiation. It is interesting that presence of harm was also not used to predict substantiation, although observable harm as evidence of maltreatment would presumably make maltreatment allegations easier for workers to substantiate.

This review has highlighted new areas relevant to policy. The multiple disciplines involved in child maltreatment were addressed in an article describing teachers' reporting practices and the response to these by child welfare services.[23] This expands upon our knowledge of the reporting practices of different disciplines, in the same way that a similar article in the previous review described health care professionals' reporting to child welfare agencies.[39] In addition, another article was about variables associated with joint police and child welfare worker investigations.[31]

Although changes to the CIS questionnaire are kept to a minimum between cycles, changes have been made to capture changes in practice. For example, CIS–2008 was changed to collect information on risk-only investigations.[3] One of the articles focussed on untangling risk of future maltreatment from past events of maltreatment.[18]

Uses of the CIS data have evolved over time. In contrast to the previous review,[7] in which 54% of studies were multivariate, 62.5% of the studies included in this review used multivariate approaches. Despite the increase in use of multivariate techniques, the objectives of most of the included studies did not include clear directional hypotheses as recommended.

The previous review[7] found that physical abuse was the most frequently studied category of maltreatment as a main focus and exposure to IPV was the least. In the present review, nearly all the multivariate articles included either all forms of maltreatment or no forms of maltreatment as independent or control variables. The finding that more papers have focussed on exposure to IPV, emotional maltreatment and neglect is important for policy makers because neglect and exposure to IPV were the first and second most substantiated forms of maltreatment in the CIS–2008 and emotional maltreatment was the fourth.[3] The three articles that focussed on neglect identified risk factors,[29,33] found a low presence of harm[29] and found that fathers are less likely to be present in cases of neglect.[28] The three articles that focussed on emotional maltreatment suggested that the increased specificity of definitions in the CIS–2008 helped differentiate between the occurrence and the risk of emotional maltreatment,[34] demonstrated that emotional maltreatment often co-occurs with other forms of maltreatment[11] and demonstrated that substantiated cases of single form emotional maltreatment are associated with more severe emotional impacts than other forms of maltreatment.[10] The three articles that focussed on exposure to IPV described the characteristics of cases of exposure to IPV in single form, exposure to IPV and other maltreatment and exposure to other maltreatment;[25] suggested that exposure to different subtypes of IPV may have different associations with child functioning;[6] and suggested that investigations of exposure to IPV or hitting only had lower-risk factors and were less likely to remain open compared with other investigations.[33]

Another notable topic for recent uses of CIS data was investigations involving First Nations children. Five articles explored topics specifically related to First Nations children, including factors influencing overrepresentation at the investigation stage,[30] placement decisions[9,13,14] and differences from reports on non-Aboriginal children.[32] Compared to investigations involving non-Aboriginal children, those involving First Nations children

had a greater percentage of every caregiver/household risk factor (except health issues) identified by workers.[30] This could indicate a need for increased availability of family support services for First Nations families; however, the possibility exists that increased risk factors for these families are due to assessment bias.

Strengths and limitations

This review had a number of strengths. To increase the accuracy of judgments, all articles were reviewed by at least two raters who were not the authors of the article being evaluated. We used a standardized quality assessment tool used in an earlier review of CIS data usage[7] to allow our findings to be compared to theirs. We included recent articles and articles based on oversample data, which broadened our scope.

This review also had a number of limitations. It did not include book chapters, theses, dissertations, government or agency reports, or unpublished manuscripts. It is possible that by excluding these sources we are failing to capture the breadth and depth of the research using CIS and CIS oversample data. We chose to exclude these sources, however, because they are not usually peer reviewed. Although oversample data exists for British Columbia, Alberta, Saskatchewan and the Northwest Territories, to our knowledge analyses stemming from these samples have not been published in peer-reviewed journals. Furthermore, we may have missed some articles from oversampling studies because data requests for these are not necessarily made through the Public Health Agency of Canada. In addition, because we only included published articles, our findings may suffer from publication bias (i.e. statistically significant variable associations may be overrepresented because nonsignificant findings are less likely to be published). Note, however, that most of the articles we included also presented findings of nonsignificant associations between variables. We include these nonsignificant findings in Table 3 to demonstrate the lack of relationships between some independent and dependent variables.

There are also limitations to our findings due to the nature of the CIS data. In reviewing these articles some of the limitations of the data were highlighted. Among these limitations are seasonal variations, the lack of independent verification of the data and the use of proxy-informants. In addition, CIS data only includes children who are reported to and investigated by child welfare agencies. Thus, selection bias may impact the population of children identified in the CIS as some children who experience abuse or neglect (for example, children from low-income families) may be more likely to be the subject of child welfare reports than others.[3]

Furthermore, the criterion validity of the variables within the CIS data may vary. For example, child welfare workers investigating reports of maltreatment or suspected maltreatment can be expected to be better trained and have greater expertise in assessing maltreatment characteristics compared to assessing child and caregiver functioning concern variables as identifying maltreatment would be their primary objective. As previously noted,[40] child functioning concerns may be underestimated because they are assessed using a checklist of issues known or suspected by the child welfare worker rather than a standardized systematic assessment, which would not be feasible in the study. In addition, not all child functioning items are relevant to different age groups. Analyses using the full age range of investigated children could have restricted ages of those included in the analyses to account for this; however, many did not.

Finally, all variables were measured at the time of the investigation. As such, it is impossible to know whether child maltreatment preceded child functioning concerns; nor can causality be established. These limitations are important for knowledge users and for researchers. The latter could study ways of further improving the quality of the data by considering the limiting parameters of the study.

Conclusions

This review has described the evolving nature of the application of the CIS and CIS oversample data to answer questions about substantiation, placement, provision of services and the impact of maltreatment on child functioning. It is clear that a multitude of factors determine these outcomes. Researchers using CIS data have recently focussed on categories of maltreatment (exposure to IPV, neglect and emotional maltreatment) that were previously inadequately studied, and examined factors specific to First Nations children.[7] This review has highlighted newly investigated areas relevant to policy. It also suggests that data from the CIS oversamples has generally been underutilized in the peer-reviewed literature. In the future, researchers using CIS data may benefit from this analysis as it identified common pitfalls. The summary of research findings may help researchers identify unexplored topics in the CIS. Future research with CIS and CIS oversample data should continue to utilize sophisticated statistical modelling methods to take advantage of the breadth of information available to address research objectives.

Acknowledgements

The authors would like to thank Dr. Wendy Hovdestad and Dr. Anne-Marie Ugnat for their help in evaluating some of the articles included in the review.

References

1. Trocmé N, MacLaurin B, Fallon B, et al. Canadian incidence study of reported child abuse and neglect: Final report. Ottawa (ON): Minister of Public Works and Government Services Canada; 2001.

2. Trocmé N, Fallon B, MacLaurin B, et al. Canadian incidence study of reported child abuse and neglect – 2003: major findings. Ottawa (ON): Minister of Public Works and Government Services Canada; 2005.

3. Public Health Agency of Canada. Canadian Incidence Study of Reported Child Abuse and Neglect 2008: Major findings. Ottawa (ON): Public Health Agency of Canada; 2010.

4. Tonmyr L, Jack SM, Brooks S, Williams G, Campeau A, Dudding P. Utilisation of the Canadian Incidence Study of Reported Child Abuse and Neglect in child welfare agencies in Ontario. Chronic Dis Inj Can. 2012;33(1):29-37.

5. Tonmyr L, Martin WK. How has child maltreatment surveillance data been used in Canada?. Health Res Policy Syst.2014;12(1): 65:1-9.

6. Gonzalez A, MacMillan H, Tanaka M, Jack SM, Tonmyr L. Subtypes of exposure to intimate partner violence within a Canadian child welfare sample: Associated risks and child maladjustment. Child Abuse Negl. 2014;38:1934-44.

7. Tonmyr L, Ouimet C, Ugnat AM. A review of findings from the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS). Can J Public Health. 2012;103(2):103-12.

8. Afifi TO, Taillieu T, Cheung K, Laurence YK, Tonmyr L, Sareen J. Substantiated reports of child maltreatment from the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS) 2008: examining child and household characteristics and child functional impairment. Can J Psychiatry. 2015;60(7):315-23.

9. Chabot M, Fallon B, Tonmyr L, MacLaurin B, Fluke J, Blackstock C. Exploring alternate specifications to explain agency-level effects in placement decisions regarding aboriginal children: further analysis of the Canadian Incidence Study of Reported Child Abuse and Neglect Part B. Child Abuse Negl. 2013;37:61-76.

10. Chamberland C, Fallon B, Black T, Trocmé N, Chabot M. Correlates of substantiated emotional maltreatment in the second Canadian Incidence Study. J Fam Viol. 2012;27:201-13.

11. Chamberland C, Laporte L, Lavergne C, et al. Psychological maltreatment of children reported to youth protection services. J Emotional Abuse. 2005;5:65-9.

12. Clément M-E, Chamberland C, Tourigny M, Mayer M. Taxinomie des besoins des enfants dont les mauvais traitements ou les troubles de comportement ont été jugés fondés par la direction de la protection de la jeunesse. Child Abuse Negl. 2009;33:750-65.

13. Fallon B, Chabot M, Fluke J, Blackstock C, MacLaurin B, Tonmyr L. Placement decisions and disparities among Aboriginal children: further analysis of the Canadian Incidence Study of Reported Child Abuse and Neglect Part A: comparisons of the 1998 and 2003 surveys. Child Abuse Negl. 2013;37:47-60.

14. Fallon B, Chabot M, Fluke J, Blackstock C, Sinha V, Allan K, MacLaurin B. Exploring alternate specifications to explain agency-level effects in placement decisions regarding Aboriginal children: further analysis of the Canadian Incidence Study of Reported Child Abuse and Neglect Part C. Child Abuse Negl. Forthcoming 2015.

15. Fallon B, Ma J, Black T, Wekerle C. Characteristics of young parents investigated and opened for ongoing services in child welfare. Int J Ment Health Addiction. 2011;9:365-81.

16. Fallon B, Ma J, Allan K, Pillhofer M, Trocmé N, Jud A. Opportunities for prevention and intervention with young children: lessons from the Canadian Incidence Study of Reported Child Abuse and Neglect. Child Adolesc Psychiatry Ment Health. 2013;7:1-13.

17. Fallon B, Ma J, Allan K, Trocmé N, Jud A. Child maltreatment-related investigations involving infants: opportunities for resilience?. Int J Child Adolesc Resil. 2013;1:35-47.

18. Fallon B, Trocmé N, MacLaurin B, Sinha V, Black T. Untangling risk of maltreatment from events of maltreatment: An analysis of the 2008 Canadian Incidence Study of Reported Child Abuse and Neglect (CIS-2008). Int J Ment Health Addiction. 2011; 9:460-79.

19. Fast E, Trocmé N, Fallon B, Ma J. A troubled group? Adolescents in a Canadian child welfare sample. Child Youth Serv Rev.2014;46:47-54.

20. Feldman M, McConnell D, Aunos M. Parental cognitive impairment, mental health, and child outcomes in a child protection population. J Ment Health Res Intellect Disabil. 2012; 5(1):66-90.

21. Hovdestad W, Shields M, Williams G, Tonmyr L. Vulnerability within families headed by teen and young adult mothers investigated by child welfare in Canada. Health Promot Chronic Dis Prev.2015;35(8/9):143-50.

22. Jud A, Fallon B, Trocmé N. Who gets services and who does not? Multi-level approach to the decision for ongoing child welfare or referral to specialized services. Child Youth Serv Rev.2012;34:983-8.

23. King CB, Scott KL. Why are suspected cases of child maltreatment referred by educators so often unsubstantiated?. Child Abuse Negl. 2014;38:1-10.

24. Lee B, Rha W, Fallon B. Physical abuse among Asian families in the Canadian child welfare system. J Aggress Maltreat Trauma. 2014;23:532-51.

25. Lefebvre R, Van Wert M, Black T, Fallon B, Trocmé N. A profile of exposure to intimate partner violence investigations in the Canadian child welfare system: an examination using the 2008 Canadian Incidence Study of Reported Child Abuse and Neglect (CIS-2008). Int J Child Adolesc Resil. 2013; 1(1):60-73.

26. Ma J, Van Wert M, Lee B, Fallon B, Trocmé N. Non-English/non-French speaking caregivers involved with the Canadian child welfare system: Findings from the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS-2008). Int J Child Adolesc Resil. 2013;1(1):23-34.

27. Marcotte J, Cloutier R, Tourigny M, et al. Mauvais traitments ou troubles de comportement: Étude des variables qui distinguent l'appartenance à l'um ou l'autre de ces problémati. ques. Intervention. 2003; 119:58-70.

28. Mayer M, Dufour S, Lavergne C, Girard M, Trocmé N. Structures familiales, paternité et négligence: des réalités à revisiter. Revue de psychoeducation. 2006;35(1):155-76.

29. Ruiz-Casares M, Trocmé N, Fallon B. Supervisory neglect and risk of harm. Evidence from the Canadian child welfare system. Child Abuse Negl.2012;36:471-80.

30. Sinha V, Trocmé N, Fallon B, MacLaurin B. Understanding the investigation-stage overrepresentation of First Nations children in the child welfare system: an analysis of the First Nations component of the Canadian Incidence Study of Reported Child Abuse and Neglect 2008. Child Abuse Negl. 2013; 37:821-31.

31. Tonmyr L, Gonzalez A. Correlates of joint child welfare and police child sexual abuse investigations: results from the Canadian Incidence Study of Reported Child Abuse and Neglect-2008. Health Promot Chronic Dis Prev. 2015;35(8/9):130-7.

32. Tourigny M, Domond P, Trocmé N, Sioui B, Baril K. Incidence of maltreatment of Aboriginal children reported to youth protection in Quebec: intercultural comparisons. First Peoples Child Family Rev. 2007; 3(3):103-19.

33. Trocmé N, Fallon B, Sinha V, Van Wert M, Kozlowski A, Maclaurin B. Differentiating between child protection and family support in the Canadian child welfare system's response to intimate partner violence, corporal punishment, and child neglect. Int J Psychol. 2013;48(2):128-40.

34. Trocmé N, Fallon B, MacLaurin, et al. Shifting definitions of emotional maltreatment: an analysis child welfare investigation laws and practices in Canada. Child Abuse Negl. 2011;35:831-40.

35. Trocmé N, Fallon B, MacLaurin B, Neves T. What is driving increasing child welfare caseloads in Ontario? Analysis of the 1993 and 1998 Ontario Incidence Studies. Child Welfare. 2005;84(3):341-62.

36. Trocmé N, Kyte A, Sinha V, Fallon B. Urgent protection versus chronic need: clarifying the dual mandate of child welfare services across Canada. Soc Sci. 2014;3:483-98.

37. Trocmé N, McPhee D, Tam KK. Child abuse and neglect in Ontario: incidence and characteristics. Child Welfare. 1995;74(3):563-86.

38. Van Wert M, Ma J, Lefebvre R, Fallon B. An examination of delinquency in a national Canadian sample of child maltreatment-related investigations. Int J Child Adolesc Resil. 2013;1(1):48-59.

39. Tonmyr L, Li A, Williams G, Scott D, Jack S. Patterns of reporting to child protection services in Canada by healthcare and non-healthcare professionals. Paediatr Child Health. 2010;15(8):e25-32.

40. Nasserie T. The child functioning items in the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS). Ottawa (ON): Public Health Agency of Canada; 2014.

Correlates of joint child protection and police child sexual abuse investigations: results from the Canadian Incidence Study of Reported Child Abuse and Neglect–2008

L. Tonmyr, PhD (1); A. Gonzalez, PhD (2)

This article has been peer reviewed.

Tweet this article

Abstract

Introduction: Our study examines the frequency of joint investigations by child protection workers and the police in sexual abuse investigations compared to other maltreatment types and the association of child-, caregiver-, maltreatment- and investigation-related characteristics in joint investigations, focussing specifically on investigations involving sexual abuse.

Methods: We analyzed data from the Canadian Incidence Study of Reported Child Abuse and Neglect–2008 using logistic regression.

Results: The data suggest that sexual abuse (55%), and then physical abuse, neglect and emotional maltreatment, are most often co-investigated. Substantiation of maltreatment, severity of maltreatment, placement in out-of-home care, child welfare court involvement and referral of a family member to specialized services was more likely when the police were involved in an investigation.

Conclusion: This study adds to the limited information on correlates of joint child protection agency and police investigations. Further research is needed to determine the effectiveness of these joint investigations.

Keywords: child abuse, child sexual abuse, child maltreatment, police, child protection worker

Key findings

- Sexual abuse is the maltreatment category most often jointly investigated by child protection and police, followed by physical abuse, neglect and emotional maltreatment.
- We found that substantiation of maltreatment, severity of maltreatment, placement in care, involvement of the child welfare court and referrals of a family member to specialized services were more likely in joint investigations.

Introduction

Child maltreatment is a challenging problem that requires multidisciplinary approaches to solving it. The social determinants of health almost exclusively fall outside the traditional health sector, and this is particularly true for child maltreatment as a health issue.[1] Both police officers and child protection workers are mandated to protect children from harm, and since the late 1960s the police have actively collaborated with social workers to protect children from maltreatment.[2] Joint investigations involving child protection services and the police are consistent with a public health approach to addressing child maltreatment. In fact, the World Health Organization champions multisectoral collaboration as an important component in preventing child maltreatment and improving the health of children.[3] Such joint investigations have led to increased communication and cooperation between the police and child protection agencies, with the development of written policies, interagency agreements and multidisciplinary teams.

Although a body of literature investigating the attitudes and perceptions of interagency collaborations exists, data examining characteristics of joint investigations are limited. An increased understanding of what factors are associated with joint investigation may help inform future practice and policy standards.

All Canadian jurisdictions have protocols on how and when joint investigations should take place; however, the type and level of collaboration varies, as it does in the United States (US).[4] For instance, in Alberta, under the *Criminal Code of Canada*, child protection workers report to the police if they think an offence has been committed.[5] In British Columbia, when a police officer has reasonable grounds to believe that a child's safety or well-being is in immediate danger, the officer has the authority to take charge of the child and notify a child protection worker as quickly as possible.[6]

One example of collaboration in Canada are the Child Advocacy Centres, which have been funded by the Department of Justice since 2010 and which are currently being

Author references:

1. Surveillance and Epidemiology Division, Public Health Agency of Canada, Ottawa, Ontario, Canada
2. Department of Psychiatry and Behavioural Neurosciences, Offord Centre for Child Studies, McMaster University, Hamilton, Ontario, Canada

Correspondence: Lil Tonmyr, Surveillance and Epidemiology Division, Public Health Agency of Canada, 785 Carling, AL 6807B, Ottawa, ON K1A 0K9; Tel: 613-240-6334; Email: Lil.Tonmyr@phac-aspc.gc.ca

evaluated.[7] Similar centres in the US have been shown to be effective.[8] These child-focussed centres include teams representing law enforcement, child protection services, prosecution, mental health services, victim advocacy services and child advocacy.[8]

Investigations tend to exist on a continuum: formal joint investigations, where these two groups of professionals *must* collaborate about certain types of maltreatment; informal joint investigations, where they *may* work together; and separate investigations, which state one or the other is solely responsible for the investigation.[9] Formal joint investigation protocols are most common for physical and sexual abuse.[9] The goals of these joint investigations are to (1) reduce the child's discomfort and trauma by decreasing the number of interviews;[10] and (2) to better protect the child by improving evidence-gathering through increased communication among professionals.[10,11]

Both child protection workers and police officers have raised several concerns to do with their joint involvement in child maltreatment investigations. Stanley et al.[12] found that the police have a limited understanding of what child protection workers do with the information the police give them. Similarly, police officers expressed concern about delays by child protection workers in informing them about cases,[12] as well as their attitudes, job performances and capacity to make decisions.[2] According to Holdaway,[13] child protection workers are not always available when needed, leaving the police with unresolved problems (e.g. a parent is arrested in the early morning hours and their child is in need of shelter). Conversely, child protection workers were concerned about the police moving too quickly and believed that they were not responsive to constructive criticism.[14] In addition, police culture sometimes clashed with child protection workers' anti-discriminatory and anti-oppressive attitudes.[2] Interviews conducted with children were cited as the main source of conflict between the police and child protection workers.[14] Organizational constraints, such as different working hours, dissimilar geographical areas of jurisdiction and a lack of resources added to the difficulties in collaboration. Each organization felt their professional identity could erode over time.[14]

TABLE 1
Description of variable used in the Canadian Incidence Study of Reported Child Abuse and Neglect–2008

Variable[a]	Description
Joint investigation	Level of police involvement in the current child welfare investigation: investigation only, charges considered and charges laid
Sexual abuse	The child had been sexually molested or sexually exploited. This could include penetration, attempted penetration, oral sex, fondling, sex talk or images, voyeurism, exhibitionism, exploitation and other sexual abuse
Physical abuse	The child was physically harmed or could have suffered physical harm because of the behaviour of the person looking after the child. Codes included shake, push, grab, throw, hit with hand, punch, kick, bite, hit with object, choke, poison, stab and other physical abuse
Neglect	The child has been harmed or the child's safety or development has been endangered as a result of a failure to provide for or protect the child. Codes included failure to supervise, leading to physical harm; failure to supervise, leading to sexual abuse; permit criminal behaviour; physical neglect; medical/dental neglect; failure to provide psychological treatment; abandonment; and educational neglect
Emotional maltreatment	The child had suffered, or was at substantial risk of suffering, emotional harm caused by the person looking after the child. Codes included terrorizing, threatening violence, verbal abuse, belittling, isolation, confinement, inadequate nurturing, exploitation, corrupting behaviour and exposure to non-partner violence
Exposure to IPV	The child directly witnessed violence between intimate partners; was indirectly exposed to violence (overhears but does not see; or sees some of the immediate consequences, e.g. injuries; or the child is told or overhears conversations about the assault); and was exposed to emotional violence between intimate partners
Multiple type	Any type of sexual abuse co-occurring with another category of maltreatment
Primary caregiver substance (alcohol and/or drug) abuse present	If the child protection worker or another worker diagnosed, disclosed, observed, had documented in the file or at the conclusion of the investigation thought it was likely that the primary caregiver abused alcohol and/or drugs
IPV confirmed/suspected	If the child protection worker suspected or confirmed that the primary or secondary caregiver was a victim or perpetrator of domestic violence
Child's sex	Male/female
Alleged perpetrator age	40 years or younger vs 41 years or older
Alleged perpetrator sex	Male/female
Alleged perpetrator	Primary caregiver, secondary caregiver or "other person"
Substantiated maltreatment	Child maltreatment was confirmed after an investigation by a child protection worker
Harm	Physical and/or emotional harm
Severity	The child required therapeutic treatment for mental/emotional harm and/or medical treatment and/or their health/safety was seriously endangered
Referral	At least one referral for services for any family member

Abbreviation: IPV, intimate partner violence.

Note: The selection of variables was guided by the work of Cross et al.[17] as well as by hypotheses about factors that would increase the likelihood of a joint investigation.

[a] We have described the relationship in those investigations where sexual abuse was the sole category of maltreatment.

Despite these challenges, joint investigations have their advantages. Working collaboratively improves communication between police officers and child protection workers. Both professional groups share information more equally, plan more

comprehensively, support each other and bring distinctive skills, knowledge and experience to an investigation.[14]

The benefits of working together can also occur at an individual level. Child protection workers felt safer in potentially dangerous situations when police officers were present.[2] In addition, police officers are legally permitted to use force in particular circumstances, which justifies requests for their presence when addressing high-risk family conflicts.[13] Furthermore, working closely together promotes understanding of the other agency's function, importance and competencies. Child protection workers reported learning more about the criminal justice system from the police,[14] whereas from child protection workers the police learned more about communicating with children, including using appropriate language and incorporating toys and play to increase children's comfort in engaging with them.[15] Joint investigations can also spare the child repeat interviews.[4,16]

Knowledge about the characteristics of joint investigations is sparse. One U.S. study found that the majority of sexual abuse investigations were a joint effort (45%) compared to other types of investigations including physical abuse (28%) and neglect (18%).[17] The credibility of an allegation was strongly predicted by police involvement in the investigation. In addition, caregiver alcohol and/or drug abuse, the severity of abuse, and active domestic violence often increased police involvement. Moreover, it was more likely that services would be provided to the child/family if there was a police investigation.[17]

No such study has been conducted in Canada. A case vignette study that assessed attitudes towards incidents of incest found that the police focussed on collecting evidence whereas child protection workers concentrated on the safety of the child and long-term implications for the family.[18] However, although hypothetical vignettes are important, they fail to address the complexities involved in decision making and may not reflect what actually occurs.

Given this shortage of information regarding children investigated by child welfare, the Public Health Agency of Canada (PHAC) and partners initiated the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS), which provides a unique opportunity to investigate police involvement with child protection agencies using multivariate techniques.

We used CIS data in this study in order to examine the frequency of joint child protection worker and police investigations into sexual abuse cases compared to other maltreatment types, and to examine the association of child-, caregiver-, maltreatment- and investigation-related characteristics in joint investigations, focussing on investigations involving sexual abuse. Although joint investigations can occur for all types of child maltreatment, we focus on sexual abuse since all jurisdictions across Canada have developed joint protocols for sexual abuse.[5,6,19,28]

Methods

Data source

The data used came from the Canadian Incidence Study of Reported Child Abuse and Neglect–2008 (CIS–2008).[29] The CIS was developed by PHAC with its partners to obtain estimates of child maltreatment reported to child protection agencies across Canada. The CIS was approved by McGill University's Ethics Committee. Details of the methodology of the CIS are outlined elsewhere.[29] In brief, the study used a multistage, stratified, cluster design to acquire a sample of investigations from all 13 jurisdictions in Canada. For 2008, data were collected from October 1 to December 31, 2008, from 112 of 412 agencies. Child protection workers provided information for each child investigated using a standardized CIS three-page form four to six weeks after the initial report to the agency. Researchers provided a half-day training course on how to complete the form. Researchers were also available to answer any questions throughout the data collection period.

Measures

The selection of variables was guided by the work of Cross et al.[17] as well as by hypotheses about factors that would increase the likelihood of a joint investigation (see Table 1).[29] Types of maltreatment included exposure to intimate partner violence (IPV), emotional abuse, neglect, physical abuse and sexual abuse. In the CIS, up to three were collected for each child.

Statistical analysis

We included only child maltreatment investigations in our analysis. Investigations focussed on "risk of future maltreatment" were excluded, as were investigations involving youth over 15 years as 15 is the oldest age for which child protection services are provided in some jurisdictions. Given that little is known about the characteristics of sexual abuse investigations that involve police, this analysis was largely exploratory. Proportions, or means and standard deviations (SD), were described for all variables of interest. Colinearity

TABLE 2
Breakdown of types of primary child maltreatment in joint child welfare and police investigations

Primary child maltreatment	Joint investigations			
	No		Yes	
	N	%	N	%
Exposure to IPV	2562	94.4	153	5.6
Emotional abuse	1001	92.2	85	7.8
Neglect	3915	90.0	436	10.0
Physical abuse	2340	79.0	621	21.0
Sexual abuse	308	44.4	386	55.6

Abbreviation: IPV, intimate partner violence.

TABLE 3
Profiles of maltreatment categories in sexual abuse investigations in joint child welfare and police investigations

Distribution of maltreatment categories	N	%
Sexual abuse only	573	68.1
Sexual abuse and neglect	128	15.2
Sexual abuse and physical abuse	43	5.1
Sexual abuse and emotional abuse	23	2.7
Sexual abuse and exposure to IPV	23	2.7
Sexual abuse and neglect and emotional abuse	13	1.5
Sexual abuse and neglect and exposure to IPV	13	1.5
Sexual abuse and physical abuse and emotional abuse	8	1.0
Sexual abuse and physical abuse and exposure to IPV	8	1.0
Sexual abuse and physical abuse and neglect	7	0.8
Sexual abuse and emotional abuse and exposure to IPV	—	—

Abbreviation: IPV, intimate partner violence.

— Estimates of < 5.

between independent variables was tested using chi-square or correlations. Bivariate associations between each variable and the outcome were tested with logistic regression. Due to the large sample size, the criterion for significance was as follows: the increase in predictive power between the model with only a constant and the model with the single variable had to equal or exceed Cox and Snell R^2 of .01. Independent variables that had a significant bivariate relationship with police involvement were considered for entry into the model. Various models were tested to determine the most parsimonious model that would explain the greatest proportion of variance in police involvement. In all models, variables were entered in one step. Analyses were run in SUDAAN (SUDAAN for Windows, version 7.5.3, Research Triangle Institute, NC, USA), which makes variance adjustments for the correlated data resulting from the survey's design. The nesting variables were agency and family.

Results

Including child maltreatment investigations of those aged under 16 years resulted in a sample of 11 807. Table 2 includes the entire sample to show police involvement in the investigation of the five maltreatment types. Compared with investigations of exposure to IPV (reference), emotional maltreatment was 1.4 times (95% CI: 1.1–1.9) more likely to have police involved in the investigation, neglect about twice as likely (odds ratio [OR] = 1.9; 95% CI: 1.5–2.2), physical abuse 4.5 times as likely (95% CI 3.8–5.4) and investigations of sexual abuse about 21 times more likely to have police involvement (OR = 20.9; 95% CI: 16.8–26.9). About 55% of sexual abuse investigations were conducted jointly (see Table 2).

Of the 11 807 investigations, 842 had sexual abuse as one of the three categories of maltreatment. Table 3 shows that over two-thirds of cases were sexual abuse without co-occurring maltreatment (68.1%), followed by sexual abuse and neglect (15.2%). Fondling (32.3%) and other sexual abuse (27.2%) occurred most frequently, followed by penetration (8.3%), sex talk or images (3.7%), oral sex (3.3%), exhibitionism (2.7%) and attempted penetration (2.0%). Voyeurism occurred in less than 1% of the sample. Information on what acts constituted "other sexual abuse" were not available.

Investigations of female victims were twice as likely to have the police involved (OR = 2.1; 95% CI: 1.6–2.9) (see Table 4). Having more than one subtype of sexual abuse (OR = 2.2; 95% CI: 1.3–3.6), severe maltreatment (OR = 2.9; 95% CI: 1.8–4.5) or evidence of harm (OR = 3.5; 95% CI: 2.3–5.3) increased the likelihood of police involvement (see Table 5). Investigations where the alleged perpetrator was identified as "other person" (someone other than the primary or secondary caregiver; OR = 1.8; 95% CI: 1.2–2.6; primary caregiver reference category) or involved a male alleged perpetrator (OR = 1.9; 95% CI: 1.3–2.8), were more likely to involve police.

Family members as well as peers were the "other persons" most commonly involved in joint investigations where sexual abuse was the sole investigation of maltreatment (see Table 6).

Police involvement in the investigation was associated with an increased likelihood that the case would be substantiated (OR = 4.5; 95% CI: 3.1–6.6), that the child would be placed or considered to be placed into care

TABLE 4
Characteristics of child and primary caregiver in joint child welfare and police investigations

	Joint investigations					
	Yes		No		Total	
	N	%	N	%	N	%
Sex of child						
Male	120	27.4	179	44.3	299	35.5
Female	318	72.6	225	55.7	543	64.5
Total	438	100.0	404	100.0	842	100.0
Substance abuse by primary caregiver						
Suspected/confirmed	16	3.7	12	3.0	28	3.3
No	422	96.3	392	97.0	814	96.7
Total	438	100.0	404	100.0	842	100.0
Mean (SD) age of child age, years	9.1 (4.2)		8.4 (4.0)		8.8 (4.1)	

Abbreviation: SD, standard deviation.

TABLE 5
Characteristics of child maltreatment and related variables in child welfare and police investigations

	Joint investigations					
	Yes		No		Total	
	N	%	N	%	N	%
Sexual abuse only vs sexual abuse with other maltreatment						
Multitype	125	28.5	144	35.6	269	31.9
Sexual abuse alone	313	71.5	260	64.4	573	68.1
Total	438	100.0	404	100.0	842	100.0
Number of subtypes of sexual abuse						
One	357	81.5	366	90.6	723	85.9
More than one	81	18.5	38	9.4	119	14.1
Total	438	100.0	404	100.0	842	100.0
Intimate partner violence in the home						
Yes	39	8.9	41	10.1	80	9.5
No	399	91.1	363	89.9	762	90.5
Total	438	100.0	404	100.0	842	100.0
Severity						
Severe	112	25.6	43	10.6	155	18.4
Not severe	326	74.4	361	89.4	687	81.6
Total	438	100.0	404	100.0	842	100.0
Harm						
Yes	131	29.9	44	10.9	175	20.8
No	307	70.1	360	89.1	667	79.2
Total	438	100.0	404	100.0	842	100.0
Alleged perpetrator						
Primary caregiver	95	21.7	120	29.7	215	25.6
Secondary caregiver	60	13.7	76	18.8	136	16.2
Other person[a]	282	64.5	208	51.5	490	58.3
Total	437	100.0	404	100.0	841	100.0
Sex of alleged perpetrator						
Male	345	80.6	268	72.6	613	76.9
Female	83	19.4	101	27.4	184	23.1
Total	428	100.0	369	100.0	797	100.0
Age of alleged perpetrator, years						
< 16	11	2.7	21	6.0	32	4.2
16–18	50	12.3	31	8.8	81	10.7
19–21	49	12.1	20	5.7	69	9.1
22–30	68	16.7	58	16.5	126	16.6
31–40	126	31.0	122	34.8	248	32.8
≥ 41	102	25.0	99	28.1	201	26.5
Total	406	100.0	351	100.0	757	100.0

[a] Not primary or secondary caregiver.

during the investigation (OR = 2.8; 95% CI: 1.4–5.6), that a referral to services would be made for the family (OR = 1.6; 95% CI: 1.1–2.9) and that child welfare court would become involved (OR = 3.2; 95% CI: 1.7–5.9) (see Table 7).

On examining colinearity between variables with significant associations with police involvement, we found that 36 of the 66 pairs of independent variables predictors were significantly related at $\alpha = .05$. Most notable were the associations between alleged perpetrator type—primary caregiver, secondary caregiver, other person—and their sex and between harm and severity. Perpetrator type explained 59% of the variance in perpetrator sex, and severity explained 47% of the variance in harm. Due to the high colinearity between these variables, we tested models that included either alleged perpetrator type or sex and harm or severity and were chosen based on goodness of fit. The most parsimonious model is shown in Table 8. A female victim, a male alleged perpetrator, the presence of harm and case substantiation were significantly associated with police involvement.

Discussion

Our study adds to the sparse information on correlates of joint child protection agency and police investigations. Consistent with prescribed protocols, we found that sexual abuse (55%) is the maltreatment category most often jointly investigated by child protection and police, followed by physical abuse, neglect and emotional maltreatment. This is similar to findings from USA and the United Kingdom.[14,16,17,30]

Being female (for the victims) and male (for the perpetrators) are established risk factors for child sexual abuse[31] and are associated with police involvement. Most research indicates that females are exposed to sexual abuse more often than are males.[31] However, others argue that sexual abuse of male victims is underreported.[32]

We found no differences in police involvement in sexual abuse investigations with different ages of the victims. Investigations with and without police involvement focussed on pre-adolescents. It is possible that it is easier to gather information from these children and that they may be seen as more credible sources of information.[33] Furthermore, sexual abuse of pre-adolescents may be seen as more serious and that of adolescents may be less likely to be reported.

Investigations of sexual abuse by the "other person" most often included family members or peers as perpetrators. This is consistent with research that shows that in

TABLE 6
Distribution of the "other person"[a] as alleged perpetrator in joint child welfare and police investigations where sexual abuse is the sole category of maltreatment

	Joint investigations					
	Yes		No		Total	
	N	%	N	%	N	%
Biological or step- or common-law mother/father or adoptive/foster parent[a]	41	20.7	30	21.1	71	20.9
Grandparent, uncle, aunt or other relative	48	24.2	14	9.9	62	18.2
Sibling/foster sibling, cousin, boyfriend/girlfriend, child's friend or peer	59	29.8	47	33.1	106	31.2
Family friend, babysitter/babysitter's family, neighbour or boarder	25	12.6	17	12.0	42	12.4
Recreational staff, maintenance staff, daycare provider, coach, teacher or other professional	7	3.5	0	0	7	2.1
Stranger/Unknown/Other	18	9.1	34	23.9	52	15.3
Total	198	100.0	142	100.0	340	100.0

[a] Not primary or secondary caregiver.

TABLE 7
Investigation-related characteristics in joint child welfare and police sexual abuse investigations

Investigation-related characteristic	Joint investigations					
	Yes		No		Total	
	N	%	N	%	N	%
Substantiated sexual abuse						
No	260	59.4	351	86.9	611	72.6
Yes	178	40.6	53	13.1	231	27.4
Total	438	100.0	404	100.0	842	100.0
Case previously opened for any family member						
Yes	211	49.4	225	56.7	436	52.9
No	216	50.6	172	43.3	388	47.1
Total	427	100.0	397	100.0	824	100.0
Placement						
Considered/placed	40	9.3	14	3.5	54	6.5
None	392	90.7	389	96.5	781	93.5
Total	432	100.0	403	100.0	835	100.0
Referral for any family member						
Yes	255	58.2	190	47.0	445	52.9
No	183	41.8	214	53.0	397	47.1
Total	438	100.0	404	100.0	842	100.0
Child welfare court						
Some involvement	45	10.3	14	3.5	59	7.0
No involvement	393	89.7	390	96.5	783	93.0
Total	438	100.0	404	100.0	842	100.0
Police involved in adult IPV investigation						
Some involvement	24	5.7	16	4.0	40	4.9
No involvement	399	94.3	384	96.0	783	95.1
Total	423	100.0	400	100.0	823	100.0

Abbreviation: IPV, intimate partner violence.

most instances the victim knows the perpetrator. For example, in a representative U.S. survey, Finkelhor et al.[34] found that acquaintances perpetrated sexual abuse 91% of the time compared to 7% for strangers and 2% for family. These findings are not directly comparable to our results as the above study is population based, whereas our study focusses on children known to child protection.

Several service-related variables were significantly related to joint investigations. Like Cross et al.,[17] we found that substantiation of maltreatment, severity of maltreatment, placement in care, involvement of the child welfare court and referrals of a family member to specialized services were more likely in joint investigations. We can only speculate on the reasons, given the nature of the data, but the mandate of joint investigations is to ensure safety and protection of children. This can involve providing evidence to the court for removal of the child to care or punishment of the perpetrator,[18] but it can also encompass the provision of services to improve parenting capacity whether it includes alcohol and/or drug counselling or receipt of financial assistance or child-focussed services. Cross et al.[17] suggested that the additional services offered in joint investigations may indicate that police involvement does not, in fact, cause a greater distress that hampers the relationship with the investigated families or change the focus of child protection agencies' mandate to assist children and families. Instead, this could be a reflection of the increased closeness of police and the public as a result of the movement towards community policing.[35]

Contrary to findings by Cross et al.,[17] we did not find substance abuse and IPV of the primary caregiver to be associated with an increased likelihood of police involvement—although their findings were not specific to sexual abuse but were across maltreatment types. It may be that other caregiver risk factors, not included in these analyses, such as maternal age, caregiver mental health and the presence of a stepfather[36,37] are related to increased likelihood of police involvement.

TABLE 8
Full regression model of joint child welfare and police sexual abuse investigations

Contrast	Degrees of freedom	Wald	*p* value	OR (95% CI)
Overall model	5	18.90	< .0001	
Model minus intercept	4	18.69	< .0001	
Intercept	—	—	—	0.41 (0.27–0.63)
Substantiated case (yes)	1	26.68	< .0001	2.85 (1.92–4.25)
Alleged perpetrator sex (male)	1	8.10	.0046	1.83 (1.21–2.78)
Harm (yes)	1	8.39	.0039	2.01 (1.25–3.22)
Sex of child (female)	1	9.37	.0023	1.65 (1.20–2.27)

Abbreviations: CI, confidence interval; OR, odds ratio.

Note: Cox & Snell R^2 = .16

Strengths and limitations

Although the CIS has several strengths, there are limitations that may influence the conclusions that can be drawn from the data. In fact, the CIS

- collects information on children reported to child protection agencies and thus underestimates the occurrence of maltreatment;
- portrays the clinical opinion of child protection workers, which are not independently verified;
- gathers data during three months in the fall, which may not be representative of the year; and
- uses a cross-sectional design, which precludes establishing causation.

Conclusion

The results of this analysis suggest that, of all categories of reported maltreatment, sexual abuse is most likely to involve joint investigations. Although, continued collaboration between specialized groups of child protection workers and police may be appropriate, the potential benefits of this synergistic approach need to be monitored and evaluated. Little is known about its effectiveness in Canada. Although more is known about joint investigations in the US, the Canadian context may be different due to the legal system and jurisdictional issues. Also, some authors[30] speculate whether child protection agencies have gone too far in the investigative process and have moved away from the critical matters of prevention and treatment. This question merits attention, although the present analysis suggested that more services were provided after joint investigations. The roles of other professions on multidisciplinary teams such as those within the health sector also require further attention.

More research is needed to investigate the effectiveness of joint investigations, for instance, has there been a decline in the number of times a child is interviewed? Has information-sharing between police and child protection increased? Would it be beneficial to the health of the child to have joint investigations more often for the other types of maltreatment than happens currently? These questions need to be answered in order to increase our understanding of collaborative investigations and their potential to benefit victims of child maltreatment.

Responding to child maltreatment with multidisciplinary teams will assist in an integrated response through primary and secondary prevention of child maltreatment and associated negative health outcomes, surveillance, increased public awareness, development of best practices and evaluation of programs, especially considering that children and their families received more services when investigations were joint. It is promising to see that joint investigations take place in the intended circumstances as per provincial and territorial protocols.

Acknowledgements

The authors gratefully acknowledge the assistance of Jasminka Draca, Dr. David Hubka, Ellen Jamieson, Joanne Lacroix and Caroline Wallace.

References

1. Tonmyr L, MacMillan H, Jamieson E, Kelly K. The population health perspective as a framework for studying child maltreatment outcomes. Chronic Dis Can. 2002;23(4):123-9.

2. Garrett PM. Talking child protection: the police and social workers 'working together' J Soc Work. 2004;4(1):77-97.

3. Butchart A, Harvey AP, Mian M, Furniss T. Preventing child maltreatment: a guide to taking action and generating evidence. Geneva (CH): World Health Organization; 2006. Joint publication of the International Society for Prevention of Child Abuse and Neglect.

4. Winterfeld AP, Sakagawa T. Investigation models for child abuse and neglect – Collaboration with law enforcement. Englewood (CO): American Humane Association; 2003.

5. Government of Alberta. Responding to child abuse: a handbook [Internet]. Edmonton (AB): Government of Alberta; 2005 [cited 2013 June 20]. Available from: http://justice.alberta.ca/programs_services/families/Documents/responding_to_child_abuse_handbook_2006.pdf

6. Government of British Columbia. The B.C. handbook for action on child abuse and neglect for service providers [Internet]. Victoria (BC): Government of British Columbia; 2005 [cited 2013 June 20]. Available from http://www.mcf.gov.bc.ca/child_protection/pdf/handbook_action_child_abuse.pdf

7. McDonald S, Scrim K, Rooney L. Building our capacity: children's advocacy centres in Canada [Internet]. Victims of Crime Research Digest. 2013 [modified: 2015 Jan 7; cited 2015 Jan 29];6:2-11. Available from: http://www.justice.gc.ca/eng/rp-pr/cj-jp/victim/rd6-rr6/p2.html

8. Jones LM, Cross TP, Walsh WA, Simone M. Do children's advocacy centers improve families' experiences of child sexual abuse investigations? Child Abuse Negl. 2007;31:1069-85.

9. Moran-Ellis J, Fielding N. A national survey of the investigation child sexual abuse. Brit J Soc Work. 1996;26:337-56.

10. Sheppard DI, Zangrillo PA. Coordinating investigations of child abuse. Public Welfare. 1996;54(1):21-31.

11. Jones LM, Cross TP, Walsh WA, Simone M. Criminal investigations of child abuse: the research behind "best practices". Trauma Violence Abuse. 2005;6(3):254-68.

12. Stanley N, Miller P, Foster HR, Thomson G. Children's experiences of domestic violence: developing an integrated response from police and child protection services. J Interpers Violence. 2011;26(12):2371-91.

13. Holdaway S. Police and social work relations – problems and possibilities. Brit J Soc Work. 1986;16:137-60.

14. Lloyd S, Burman M. Specialist police units and the joint investigation of child abuse. Child Abuse Review. 1996;5:4-15.

15. Brown L, Fuller R. Central Scotland's joint police and social work initiative in child abuse: an evaluation. Child Soc. 1991;5(3):232-240.

16. Tjaden PG, Anhalt J. The impact of joint law enforcement child protective services investigations in child maltreatment cases. Denver (CO): Centre for Policy Research; 1994.

17. Cross TP, Finkelhor D, Ormrod R. Police involvement in child protective services investigations: Literature review and secondary data analysis. Child Maltreat. 2005;10(3):224-44.

18. Trute B, Adkins E, MacDonald G. Professional attitudes regarding treatment and punishment of incest: community police, child welfare and community mental health. J Fam Violence. 1996;11(3):237-49.

19. Government of Manitoba. Child and family services manual [Internet]. Winnipeg (MB): Manitoba Family Services and Housing: 2008 Jul 2 [updated 2008 Oct 10; cited 2013 June 20]. Available from: http://www.gov.mb.ca/fs/cfsmanual/pubs/pdf/1.3.7_enp.pdf

20. Government of New Brunswick. Child victims of abuse and neglect: protocols [Internet]. Fredericton (NB): Government of New Brunswick; 2005 Mar [cited 2013 June 20]. Available from: http://www2.gnb.ca/content/dam/gnb/Departments/sd-ds/pdf/Protection/Child/ChildAbuseProtocols05-e.pdf

21. Government of Newfoundland and Labrador. Children and youth care and protection act [Internet]. St. John's (NL): Government of Newfoundland and Labrador: 2010 [updated 2010 Jun 24; cited 2013 June 20]. Available from: http://www.assembly.nl.ca/legislation/sr/statutes/c12-2.htm

22. Government of Northwest Territories. Child and family services act [Internet]; 2011 [cited 2013 June 20]. Available from: http://www.canlii.org/en/nt/laws/stat/snwt-1997-c-13/latest/part-1/snwt-1997-c-13-part-1.pdf

23. Government of Nova Scotia. Children and family services act [Internet]. Halifax (NS): Government of Nova Scotia; 2008 [cited 2013 June 20];[Screen 1]. Available from: http://www.novascotia.ca/just/regulations/regs/cfsregs.htm

24. Government of Prince Edward Island. Child sexual abuse protocol: guidelines and procedures for a coordinated response to child sexual abuse in Prince Edward Island [Internet]. Charlottetown (PEI): Government of Prince Edward Island; 2013 [cited 2013 June 20]. Available from: http://www.gov.pe.ca/photos/original/CSA_PROT_2013.pdf

25. Government of Quebec. Chapter P-34.1 Youth protection act [Internet]. Québec (QC): Government of Quebec; 2013 [cited 2013 June 20]. Available from: http://www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type = 2&file = /P_34_1/P34_1_A.HTM

26. Government of Saskatchewan. Provincial child abuse protocols [Internet]. Regina (SK): Government of Saskatchewan; 2014 [cited 2015 September 23]. Available from: https://www.saskatchewan.ca/government/news-and-media/2014/october/29/revised-child-abuse-protocol

27. Government of Yukon. Children's act [Screen 132] [Internet]. Whitehorse (YK): Government of Yukon; 2002 [cited 2013 June 20]. Available from http://www.gov.yk.ca/legislation/acts/childrens.pdf

28. Gough P. Ontario's child welfare system [Internet]. Toronto (ON): Centre of Excellence for Child Welfare; 2005 [cited 2015 Jan 29]. Available from: http://cwrp.ca/sites/default/files/publications/en/OntChildWelfareSystem31E.pdf

29. Public Health Agency of Canada. Canadian Incidence Study of Reported Child Abuse and Neglect 2008: major findings. Ottawa (ON): Public Health Agency of Canada; 2010. Available from: http://www.phac-aspc.gc.ca/cm-vee/csca-ecve/2008/assets/pdf/cis-2008_report_eng.pdf

30. Sanders R, Jackson S, Thomas N. The police role in the management services of child protective services. Polic Soc. 1996;6:87-100.

31. Hanson RF, Borntrager C, Self-Brown S, et al. Relations among gender, violence exposure, and mental health: The national survey of adolescents. Am Journal Orthopsychiatr. 2008;78(3):313-21.

32. Smith LH, Ford J. History of forced sex and recent sexual risk indicators among young adult males. Perspect Sex Repro H. 2010;42(2):87-92.

33. King CB, Scott KL. Why are suspected cases of child maltreatment referred by educators so often unsubstantiated? Child Abuse Negl. 2014;38:1-10.

34. Finkelhor D, Ormrod R, Turner H, Hamby SL. The victimization of children and youth: a comprehensive, national survey. Child Maltreat. 2005;10(1):5-25.

35. Thomas T. The police and social workers: creativity or conflict. Practice Soc Work Action. 1988;2(2):120-9.

36. Gilbert R, Widom CS, Browne K, Fergusson D, Webb E, Janson S. Burden and consequence of child maltreatment in high-income countries. Lancet. 2009;373:68-81.

37. Gonzalez A, MacMillan HL. Preventing child maltreatment: an evidence-based update. J Postgrad Med. 2008;54:280-6.

Commentary

Child maltreatment surveillance: enumeration, monitoring, evaluation and insight

Rebecca T. Leeb, PhD (1)*; John D. Fluke, PhD (2)

Tweet this article

Public health surveillance is "the ongoing systematic collection, analysis and interpretation of outcome-specific data for use in the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know."[1(p. 164)] Sustainable surveillance systems are thus generally designed with three functional goals in mind: enumeration, monitoring and evaluation. This framework evolved from efforts to prevent and control infectious disease, and more recently has been applied to other health problems, such as violence, that impact communities and society.[2,3]

Application of epidemiologic surveillance to child abuse and neglect (CAN) presents specific challenges related to varying definitions and incident reporting. Definitions of abuse and neglect differ within and across countries, obscuring estimates of the true magnitude of the problem. Definitions also vary depending on the nature of the child protection system.[4] Countries may lack legal or social systems with specific responsibility for responding to and recording reports of CAN, particularly countries where populations are remote or in flux (e.g. due to conflict). Underreporting of CAN results in underestimates of prevalence. Violence by caregivers toward children is often known only to the perpetrator, and depending on the developmental capacity of the child, the victim. Further, CAN cases may be reported to a wide variety of sentinels (e.g. educators, clergy, physicians, law enforcement, child welfare), or may not be reported to any official source at all. Social stigma and unintended consequences of reporting, as well as cultural and political barriers, also impact reporting both within communities and globally.

These challenges notwithstanding, epidemiological CAN surveillance systems exist in many, but not all, high-income countries and a growing number of middle and low-income countries. Surveillance in high-income countries commonly relies on data collected from child welfare agencies or from professionals who come into contact with children. The Canadian Incidence Study of Reported Child Abuse and Neglect (CIS), described in this special issue, includes data on CAN reported to child welfare agencies. Data are collected periodically by survey and analyzed to estimate incidence rates. Other data collection programs with similar sample-based survey methods such as the U.S. National Incidence Study of Child Abuse and Neglect (NIS) obtain data from child welfare agencies, but also from professionals in other settings who come into contact with children.[5]

Like the CIS, the U.S. National Child Abuse and Neglect Data System (NCANDS) is based on child welfare data, but uses a different methodology. States and territories submit administrative data on all children who are reported to the social welfare system for suspected abuse and neglect to NCANDS for analysis of prevalence and trends annually. Similar systems relying on administrative data from child welfare are in use elsewhere including the United Kingdom[6] and Australia[7] to name a few. Saudi Arabia has developed a surveillance system using hospital-based child protection teams rather than child welfare data.[4]

CAN surveillance in low- and middle-income countries, especially those with limited social services infrastructure, commonly rely on surveys asking children, and caregivers about current and past experiences of CAN. Examples of survey surveillance include the Violence Against Children Surveys (VACS) implemented in countries such as Cambodia, Haiti, Kenya, Malawi, Swaziland, Tanzania and Zimbabwe,[8] and the UNICEF Multiple Indicator Cluster Surveys (MICS) which has been implemented in more than 100 low- and middle-income countries.[9] Self-report surveys, such as the U.S.-based National Survey of Children's Exposure to Violence (Nat SCEV),[10] are also used in high-income countries because they are able to provide a broader range of information and perspective on maltreatment incidence and prevalence than administrative data or samples based on surveys of child serving professionals. However, these surveys are also subject to unique biases.

The lack of consistent case definitions and a systematic approach to data collection across available CAN surveillance systems suggests that the three functional surveillance goals may be necessary but not sufficient to achieve a full understanding

Author references:

1. Division of Human Development and Disability, National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention, Atlanta, GA, US
2. Department of Pediatrics, Kempe Center for the Prevention & Treatment of Child Abuse & Neglect, University of Colorado School of Medicine, Aurora, CO, US

Correspondence: Rebecca T. Leeb, National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention, 4700 Buford Hwy., Mailstop E-88, Atlanta, GA, 30341-3717; Tel: 404-498-6752; Fax: 404-498-0270; Email: RLeeb@CDC.gov

*The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

of the magnitude and nature of CAN. Efforts to develop more uniform definitional approaches for administrative sources have been made, but despite these attempts, it remains challenging to proffer accepted definitions in complex policy environments with multiple inter-sectorial stakeholders.[11] Further, we and others (e.g. Thacker) suggest that surveillance systems in CAN are incomplete if they do not strive to achieve some degree of insight about the data collection methods, the process of surveillance, or the underlying risk conditions.[12]

Insight

Insight can be considered as a generative analytic activity that amplifies information in a way that has implications for future surveillance and prevention efforts. It can also be characterized as a one-time event or gain; once insight is attained awareness of it can only be documented or replicated, and surveillance activities return to more attenuated enumeration, monitoring and evaluation efforts. Below we highlight four ways in which CAN surveillance has produced insights thus far.

1. How you count matters. Relying on a single source of information such as cases reported to child welfare agencies or self-report surveys provides only one view of the problem. Available data suggest that systematic triangulation of data sources is needed to fully address functional surveillance objectives and generate a complete picture of the magnitude of CAN.[13,14] Linking administrative data to common identifiers from a range of service systems is one method of triangulation, but requires adjustments to address non-uniformity of data from different sources. The Developmental Pathways Project in Western Australia has achieved success using this method of triangulation with notable impacts on knowledge and policy.[15,16] The NIS in the United States uses a different approach to triangulation in which periodic survey data are collected from a wide variety of sentinels.[17] This approach has provided direction and focus for U.S. policy and practice efforts,[18,19] but lengthy periodicity and cost of data collection makes determination of the direct impact of survey data on changes in policy and practice difficult to assess.

2. Who and what is being counted matters. For example, NCANDS provides both unique and duplicate counts in their annual report. The unique count is the number of children who experience maltreatment in a given year. The duplicate count is the number of reports received by child welfare in the given year. Thus, one provides a count of children who are maltreated while the other provides the number of incidents of abuse and/or neglect.

3. Sustainability of national surveillance systems is critical and challenging. Without regular, ongoing surveillance insight is limited to a snapshot in time; at best, one-off studies address only short-term policy goals. Systems that collect data on a periodic basis, regardless of methodology, expand the snapshot but may lack the specificity to examine the impact of incremental changes over time. The efforts by UNICEF using the MICS to track indicators of harm and exploitation of children demonstrates that sustained CAN surveillance is feasible for countries, regardless of resource limitations.[20]

4. The focus and scope of the surveillance system impacts the resulting data. Systems may focus on morbidity, mortality, or both, and could thus lead to different conclusions about CAN. Inclusion of indicators, risk and protective factors will impact what can be learned from the data. For example, analysis of data from surveillance of children in the welfare system revealed insight into relative risk of repeat maltreatment for children with a disability and underlined the importance of collecting data about disabilities and other potential risk factors for enumeration, monitoring and evaluation.[21]

These insights are consistent with concepts discussed in the U.S. Centers for Disease Control and Prevention's Updated Guidelines for Evaluating Public Health Surveillance Systems.[22] Not only can insight derived from CAN surveillance aid in evaluating and improving surveillance systems, it can also be the catalyst for those who set policy and implement programs. Relevant information, when appropriately translated, can be used in efforts to reduce violence against children and to promote relationships and environments in which children thrive. As noted by Thacker, "Unless [surveillance] information is provided to those who set policy and implement programs, its use is limited to archives and academic pursuits...."[12] (p. 5) Thus, surveillance data must be available and accessible to key stakeholders.

CAN surveillance remains a challenge for epidemiologists worldwide. But insights derived from our collective efforts, including the CIS, will help target our prevention efforts in the face of this global public health problem.

References

1. Thacker SB, Berkleman RL. Public health surveillance in the United States. Epidemiol Rev. 1988;10:164-90.

2. Dahlberg LL, Mercy JA. History of violence as a public health problem. AMA J Ethics. 2009;11(2):167-172.

3. Lee LM, Teutsch SM, Thacker SB, St. Louis ME. (eds). Principles and practice of public health surveillance. Oxford Scholarship Online; 2010. DOI: 10.1093/acprof:oso/9780193572922.001.0001

4. AlEissa MA, Fluke JD, Gerbaka B, et al. A commentary on national child maltreatment surveillance systems: examples of progress. Child Abuse Neg. 2009;33(11):809-814.

5. Sedlak AJ, Mettenberg J, Basena M, et al. Fourth National Incidence Study of Child Abuse NIS-4: report to Congress. Washington, DC: Department of Health and Human Services, Administration for Children and Families; 2010.

6. Department for Education (UK). Statistical release: referrals, assessments and children who were the subject of a child protection plan (Children in need census – provisional) year ending 31 Mar 2011 [Internet]. London (England): Department for Education; 2011 [cited 2015 June 17]. Available from: https://www.gov.uk/government/statistics/referrals-assessments-and-children-who-were-the-subject-of-a-child-protection-plan-children-in-need-census-2010-to-2011-provisional

7. Australian Institute of Health and Welfare. Child protection Australia: 2011–12. Child welfare series no. 55. Canberra: AIHW; 2013. [Catalogue No.: CWS 43].

8. Centers for Disease Control and Prevention. Towards a violence-free generation: Using science to fuel action and end violence against children [Internet]. Cited 2015 June 17. Available from: http://www.cdc.gov/violenceprevention/vacs/index.html

9. UNICEF. Multiple Indicator Cluster Surveys [Internet]. UNICEF; 2015 [cited 2015 June 17]. Available from: http://mics.unicef.org/surveys

10. Finkelhor D, Shattuck A, Turner HA, Hamby SL. Trends in children's exposure to violence, 2003 to 2011. JAMA Pediatr. 2014;168(6):540-546.

11. Leeb RT, Paulozzi LJ, Melanson C, Simon TR, Arias I. Child maltreatment surveillance: uniform definitions for public health and recommended data elements, version 1.0. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2006.

12. Thacker S. Historical Development. Lee LM, Teutsch SM, Thacker SB, St Louis ME, eds. Principles and practice of public health surveillance, 3rd ed. New York: Oxford University Press; 2010. pp. 1-17.

13. Gibbs D, Rojas-Smith L, Wetterhall S, et al. Improving identification of child maltreatment fatalities through public health surveillance. J Public Child Welf. 2013;7:1-19.

14. Krug EG, Dahlberg LL, Mercy JA, Zwi AB, Lozano R, eds. World report on violence and health. Geneva (Switzerland): World Health Organization; 2002.

15. Government of Western Australia, Department of Health. Data linkage Western Australia: Enabling health & medical research in Western Australia [Internet]. Data Linkage WA; 2015 [cited 2015 June 17]. Available from: http://www.datalinkage-wa.org/

16. Brook EL, Rosman DL, Holman CDJ, Trutwein B. Summary report: research outputs project, WA data linkage unit (1995-2003) [Internet]. Department of Health, Government of Western Australia; 2005 [cited 2015 June 17]. Available from http://www.datalinkage-wa.org.au/sites/default/files/Summary%20of%20Research%20Outputs%20Project.pdf

17. U.S. Department of Health and Human Services. The Fourth National Incidence Study of Child Abuse and Neglect [Internet]. Cited 2015 June 17. Available from: https://www.nis4.org/index.htm

18. Daro D. Child abuse prevention: a job half done. Chicago: Chapin Hall at the University of Chicago; 2010.

19. Russell J, Cooper C. Technical assistance brief, the NIS-4: what it all means (and *doesn't* mean) [Internet]. Reno (NV): National Council of Juvenile and Family Court Judges; 2011 [cited 2015 June 17]. Available from: http://www.ncjfcj.org/sites/default/files/nis-4%20technical%20assistance%20brief.pdf

20. Sumner SA, Mercy JA, Saul J, et al. Prevalence of sexual violence against children and use of social services – seven countries, 2007-2013. MMWR. 2015;64(21):565-569.

21. Fluke J, Shusterman G, Hollinshead D, Yuan YT. Longitudinal analysis of repeated child abuse reporting and victimization: multistate analysis of associated factors. Child Maltreatment. 2008;13(1):76-88.

22. Centers for Disease Control and Prevention. Updated Guidelines for Evaluating Public Health Surveillance Systems [Internet]. MMWR. 2001;50(RR13):1-35. [cited 2015 September 8]. Available from: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5013a1.htm

Editorial

The Nurse–Family Partnership: evidence-based public health in response to child maltreatment

Lil Tonmyr, PhD, Guest Editor

Tweet this article

Too many Canadian children are exposed to child maltreatment—neglect, emotional maltreatment, exposure to intimate partner violence, and physical and sexual abuse. Retrospective data indicates that 32% of Canadian adults have experienced childhood abuse.[1] There is evidence that child maltreatment is associated with a wide array of negative health consequences across the life span. These consequences expand across physical, mental, developmental and social domains to include suicide, substance abuse, anxiety, depression and physical health problems.[1-4]

Experts have asked for coordinated national leadership in protecting children from maltreatment.[5,6] They also envision broadening the mandate for injury prevention to include not only physical injury but also emotional injury and harm.

What can be done to prevent child maltreatment? This section of the special issue of *Health Promotion and Chronic Disease Prevention in Canada: Research, Policy and Practice (HPCDP)* focusses on prevention strategies for child maltreatment in Canada and, specifically, the Nurse–Family Partnership (NFP). This public health nurse intervention aims to enhance pregnancy outcomes, child health and development, and economic self-sufficiency for the young mothers and children enrolled in the intervention. The NFP, developed in the United States, has shown positive and lasting results in three randomized control trials (RCTs). These results fall in areas relevant to the mandate of the Public Health Agency of Canada:

- reduction in child maltreatment and injuries to children;
- improvement in early childhood mental health and cognitive and language development;
- advances in school readiness;
- decline in adolescent antisocial behaviour;
- enhancement of women's perinatal health;
- increases in maternal economic self-sufficiency; and
- augmentation of fathers' involvement in family-life.[7]

The founder and developer of the program, Dr. David Olds, and his colleagues at the Prevention Research Center at the University of Colorado Denver require a four-step approach before the NFP is implemented in a new society: (1) adaption to a local context (Jack et al.[8] describe the Canadian adaption in detail); (2) a pilot study to assess acceptability and feasibility in a small sample (the first two steps were implemented in Hamilton, Ontario); (3) an RCT (underway in the British Columbia Healthy Connections Project) to evaluate effectiveness of the intervention; and (4) dissemination and maintenance of the program, if it has proven effective based on the RCT results.

This issue includes four articles related to the NFP intervention program:

- In "Vulnerability within families headed by teen and young adult mothers investigated by child welfare services in Canada," Hovdestad et al.[9] show the numerous risk factors experienced by those in this vulnerable population, many of which may be modifiable by programs such as the NFP.
- In "Adapting, piloting and evaluating complex public health interventions: lessons learned from the Nurse–Family Partnership in Canadian public health settings," Jack et al.[10] describe the process of carefully adapting, assessing and evaluating the feasibility, acceptability and effectiveness of the NFP in Canada to date and the accompanying process evaluation. They also describe an adjunct study that investigates how and if the NFP can reverse biological negative outcomes related to adverse childhood experiences.
- In "Health care and social service professionals' perceptions of a home-visit program for young, first-time mothers," Li et al.[11] focus on the perspective of the community care providers responsible for referral to the NFP and for delivering services to the mothers. The data are from the Hamilton pilot study. Previous research focussed on the impact of the program on public health nurses[12] and the experiences of the mothers involved in the program.[13] Child protection workers are the source of referral for enrolment in the NFP, while the nurses who administer the program are mandated to report to child protection if they suspect child

Author reference:

Surveillance and Epidemiology Division, Public Health Agency of Canada, Ottawa, Ontario, Canada

Correspondence: Lil Tonmyr, Surveillance and Epidemiology Division, Public Health Agency of Canada, 785 Carling Avenue, AL 6807B, Ottawa, ON K1A 0K9; Tel: 613-240-6334; Email: Lil.Tonmyr@phac-aspc.gc.ca

maltreatment in the families they serve. Collaboration is paramount in this complex relationship.

- In his invited commentary, Dr. Christopher Mikton[14] of the World Health Organization, writes about Canadian efforts to tackle the "disease" of child maltreatment that affects hundreds of millions worldwide.

We await the outcome of the full evaluation of the NFP program with great interest. If the intervention shows the same effectiveness as it has in the United States, it will provide great hope for Canadian families.

References

1. Afifi TO, MacMillan HL, Boyle M, Taillieu T, Cheung K, Sareen J. Child abuse and mental disorders in Canada. CMAJ. 2014;186(9): E324-32.

2. Tonmyr L, Jamieson E, Mery LS, MacMillan HL. The relationship between childhood adverse experiences and disability due to physical health problems in a community sample of women. Women Health. 2005; 41(4):23-35.

3. MacMillan HL, Fleming JE, Streiner DL, et al. Childhood abuse and lifetime psychopathology in a community sample. Am J Psychiat. 2001;158(11):1878-83.

4. Rhodes AE, Boyle MH, Bethell J, et al. Child maltreatment and onset of emergency department presentations for suicide-related behaviors. Child Abuse Neg. 2012;36:542-51.

5. MacMillan HL. Protecting children from maltreatment: a Canadian call to action. Paediatr Child Health. 2013;18(8):409.

6. Shouldice M. Child maltreatment in Canada, 2013. Paediatr Child Health. 2013;18(8):407-8.

7. Olds DL, Sadler S, Kitzman H. Programs for parents of infants and toddlers: recent evidence from randomized trials. J Child Psych Psychiatry. 2007;48:355-91.

8. Jack SM, Busser D, Sheehan D, Gonzalez A, Zwygers EJ, MacMillan HL. Adaptation and implementation of the Nurse–Family Partnership in Canada. Can J Public Health. 2012; 103(1):S42-8.

9. Hovdestad W, Shields M, Williams G, Tonmyr L. Vulnerability within families headed by teen and young adult mothers investigated by child welfare services in Canada. Health Promot Chronic Dis Prev Can. 2015;35(8/9):143-50.

10. Jack SM, Catherine N, Gonzalez A, MacMillan HL, Sheean D, Waddell C for the BCHP Scientific Team. Adapting, piloting and evaluating complex health interventions: lessons learned from the Nurse–Family Partnership Program in Canadian public health settings. Health Promot Chronic Dis Prev Can. 2015;35(8/9):151-9.

11. Li S-A, Jack SM, Gonzalez A, Duku E, MacMillan HL. Health care and social service professionals' perceptions of a home-visit program for young, first-time mothers. Health Promot Chronic Dis Prev Can. 2015;35(8/9):160-7.

12. Dmytryshyn AL, Jack SM, Ballantyne M, Wahoush O, MacMillan HL. Long-term home visiting with vulnerable young mothers: an interpretive description of the implication public health nurses. BMC Nurs. 2015;14:12.

13. Landy CK, Jack SM, Wahoush O, Sheehan D, MacMillan HL; NFP Hamilton Research Team. Mothers' experiences in the Nurse-Family Partnership program: a qualitative case study. BMC Nurs. 2012;11:15.

14. Mikton C. Commentary. Adapting and retesting evidence-based child maltreatment prevention programs: a case study in Canada. Health Promot Chronic Dis Prev Can. 2015;35(8/9):168-70.

Vulnerability within families headed by teen and young adult mothers investigated by child welfare services in Canada

W. Hovdestad, PhD; M. Shields; G. Williams, MSc; L. Tonmyr, PhD

This article has been peer reviewed.

Tweet this article

Abstract

Introduction: Young mothers' families are at increased risk of child maltreatment and other poor health and social outcomes.

Methods: Chi-square analyses of pooled child welfare services data from the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS–2003; CIS–2008) were used to compare 284 teen mothers (18 years or younger) and 800 young mothers (19–21 years) and their families with 5752 families where the mother was 22 years or older.

Results: Twenty-six percent of young mothers were 18 years or younger. Most (68% of teen-mother families and 57% of families with a young adult mother) received social assistance as their main source of income compared with 36% of families with a mother aged 22 years or older. Teen and young adult mothers were more likely than those aged 22 or older to have childhood histories of out-of-home care (31% and 23% vs. 10%) and were more likely to have risk factors such as alcohol abuse (25% and 23% vs. 18%) and few social supports (46% and 41% vs. 37%). Secondary caregivers in families with young mothers also had more risk factors. Teen and young adult mother families were more likely to have their child placed out-of-home during the investigation (29% and 27% vs. 17%). All were equally likely to be victims of domestic violence and to have mental health issues.

Conclusion: Within this sample of high-risk families, young mothers' families were more at risk than comparison families. Mothers' youth may be a useful criterion to identify families for targeted interventions.

Keywords: child maltreatment, child abuse, family violence, teen mother, adolescent mother, out-of-home care, Canadian Incidence Study of Reported Child Abuse and Neglect

Key findings

- Data from child welfare agencies in Canada show that teen mothers have more challenges than older mothers.
- Teen mothers and the secondary caregivers in their homes are more likely to
  - receive social assistance;
  - have been placed in foster care or a group home as children;
  - abuse alcohol and/or drugs;
  - have cognitive issues; and
  - lack social support.
- Teen mothers have similar challenges to older mothers in terms of their mental health problems and exposure to intimate partner violence.
- Programs to prevent child maltreatment may need to be proactive connecting with young mothers at risk who are stressed on many fronts.

Introduction

Evidence shows that all the children born to young mothers, firstborn as well as subsequent children, and the mothers themselves, are at high risk of poor outcomes.[1,2] As a result, young motherhood is a concern within the health, educational and social service sectors. In this paper, we use data from a cross-Canada sample of child maltreatment investigations conducted in either 2003 or 2008 to describe families with teen mothers (aged 18 years or younger) and young adult mothers (aged 19–21 years) involved with child welfare services and compare them to families with mothers aged 22 years and older. The families are described in terms of modifiable risk factors (e.g. alcohol abuse, low social support) that may be targeted by intervention or support programs.

In 2010, the rate of live births to mothers aged 15 to 17 years was 7.7 per 1000 females, and for mothers aged 18 to 19 years, 25.8 per 1000 females.[3] There were notable differences associated with place of residence: in 2006–2010, age-specific live birth rates among females aged 10 to 17 years ranged from 1.6 per 1000 in Quebec to 29.4 per 1000 in Nunavut.[3] For women aged 18 to 19 years, age-specific live birth rates ranged from 17.8 per 1000 in British Columbia to 168.9 per 1,000 in Nunavut.[3] Births to mothers aged 20 years or older represented 96% of the live births in Canada in 2009.[4] Jutte et al.[2] noted that 4.2% of Canadian live births in 2006 were to adolescents.

Provincial/territorial differences in rates of young motherhood may reflect, in part, differing culture-related opinions about its desirability. Evidence for positive outcomes for young mothers and their children, and the importance of cultural factors in shaping these outcomes, has been reviewed elsewhere.[5] Nonetheless, the children of young

Author reference:

Surveillance and Epidemiology Division, Public Health Agency of Canada, Ottawa, Ontario, Canada

Correspondence: Wendy Hovdestad, Surveillance and Epidemiology Division, Public Health Agency of Canada, 785 Carling Avenue, AL 6807B, Ottawa, ON K1A 0K9; Tel: 613-799-0921; Email: wendy.hovdestad@phac-aspc.gc.ca

mothers in Canada are at risk for poor health and developmental outcomes.[2] Jutte et al.[2] studied a cohort of 32 000 children born between 1979 and 1984 who were living in Winnipeg at age 17 years. Children born to adolescent mothers (6%) and children born to prior adolescent mothers (i.e. the mother was adolescent when the oldest sibling was born, 10%) were compared with children of women who had never been adolescent mothers. Children born to teen mothers or to mothers who gave birth to an older sibling during their teen years experienced mortality rates 2 to 4 times higher than children of other mothers. For a portion of the sample, data were available about interventions by child welfare services delivered when the children were aged between 8 and 17 years. Children of current or former teen mothers were 2 to 3 times more likely to have required these interventions. Half of all cohort children who were taken into foster care were children of current or prior adolescent mothers.

In other Canadian research, analyses of data from 1928 young adults in Ontario demonstrated that those who had a mother who was young (20 years or younger) when she gave birth to her first child were more likely to have experienced abuse (either physical or sexual) during childhood.[6] This association was maintained after statistically controlling for family socioeconomic status.

Maltreatment in families headed by young mothers is of particular concern because maltreated infants and young children are very vulnerable to injury and death and are more likely to be judged to be sufficiently at risk to require out-of-home placement.[7-9] As one indicator of risk, deaths of Canadian children aged 0 to 17 years due to family-related homicide occur predominantly among infants aged less than 12 months.[9] Due to their vulnerability, the need for immediate social service intervention may be greater compared with families with older mothers and older children.

Fallon et al.[10] used data from the 2008 cycle of the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS) to describe the characteristics of young Canadian parents whose families were investigated by child welfare services and to describe the services provided to these families. They found that 22% to 23% of biological mothers aged 21 years and younger had a history of foster care or of living in a group home compared to 10% of biological mothers aged 22 to 30 years. In other analyses of all primary biological caregivers aged younger than 31 years, the researchers found that having a history of institutional care was associated with ongoing services being offered to the family, as was having few social supports and mental health and/or alcohol or substance use issues.[10]

Thus, population-based and child welfare-based data indicate that families with young mothers have more risk factors for child maltreatment and more need of intervention by child welfare services. We used combined data from the CIS from 2003 (CIS–2003) and from 2008 (CIS–2008) to describe families in Canada who were involved with child welfare services. The teen mothers, young mothers and their families are compared with families in which the mothers are 22 years or older.

Methods

Data source

This study is based on analyses of data collected in two cycles of the CIS in 2003 and 2008. Data were pooled from the two cycles to maximize sample size. The CIS identifies child maltreatment investigations from child welfare agencies across Canada during a three-month period in the autumn of the survey year. Child welfare workers fill out a three-page questionnaire on each investigated child four to eight weeks after receiving the allegation. The CIS excludes already open and screened out cases as well as cases opened for reasons other than child maltreatment. Data from Quebec were excluded from the CIS–2003 because of differences in collection methods and comparability of the data collected. More information about the CIS–2003 and CIS–2008 is available elsewhere.[11,12] Note that the Aboriginal status of children and caregivers is recorded in the CIS, but consultations with Aboriginal organizations about culturally sensitive use of these data were not conducted, so these variables were not analyzed.

Study sample

Using the pooled CIS–2003 and CIS–2008 data sets, we selected all children for whom the primary caregiver was the biological mother. We divided the sample into three groups based on the age of the mother: teen mothers aged 18 years or younger ($n = 284$); young adult mothers aged 19 to 21 years ($n = 800$) and mothers aged 22 years or older ($n = 5752$). Because of the potential stressors involved with having a young child, to increase comparability of the groups we only included families with at least one child under the age of 6. If there was more than one child under the age of 6, we selected the youngest biological child.

Measures

The questionnaire included data about the child (e.g. age and sex), the household (e.g. income source, overcrowding), the primary and secondary caregivers (e.g. sex, relationship to the child, and risk factors), service referrals made by the child welfare worker for any family member, and results of the investigation. Note that caregivers' ages were coded in ranges (< 16, 16–18, 19–21, 22–30, 31–40, 41–50, 51–60, > 60 years), limiting our ability to consider a more detailed breakdown based on the age of the mother.

For both the primary and secondary caregivers, the child welfare worker coded each risk factor as "Confirmed," "Suspected," "No" or "Unknown." We combined the percent of confirmed or suspected for alcohol abuse, drug/solvent abuse, cognitive impairment, mental health issues, few social supports, victim of domestic violence, history of foster care/group home and perpetrator of domestic violence. Cases where the child welfare worker indicated "Unknown" are included in the denominator (i.e. the caregiver is assumed not to have the risk factor).

CIS–2008 tracked two types of investigations: maltreatment investigations, where the person reporting to child welfare

services believed that maltreatment had occurred, and risk investigations, where the person reporting believed the child was at risk of future maltreatment. CIS–2003 only includes maltreatment investigations. In each maltreatment investigation the child welfare worker could investigate any of the five main types of maltreatment (physical abuse, sexual abuse, neglect, emotional maltreatment and exposure to intimate partner violence) as primary, secondary or tertiary concerns. Each type of maltreatment investigated was coded by the child welfare worker as being "Substantiated," "Suspected" or "Unfounded." We report the percent of investigations (combining primary, secondary and tertiary) by type of maltreatment and the percent substantiated among these investigations. A risk investigation was defined as being substantiated if the child protection worker indicated there was a significant risk of future maltreatment. A response of "unknown" was assumed to be "no."

Analysis

We used chi-square tests to detect differences between estimates for families with a young mother (teen or young adult mother) versus families with a mother aged 22 years or older, making the assumption that the CIS pooled sample was selected using simple random sampling. Because our focus was on examining factors associated with being a family with a young mother (as opposed to estimating population counts of families with young mothers) and due to concerns raised about the national representativeness of estimates based on CIS weighted data,[13] all analyses are based on unweighted data. Analyses were conducted using SAS Enterprise Guide 5.1 (SAS Institute Inc., Cary, NC, US).

Results

In families where the primary caregiver was a young mother (< 21 years), 26% were 18 years or younger. The most common source of household income among families with a young mother as the primary caregiver was social assistance, other benefit or no income (68% for teen mothers aged ≤ 18; 57% for young adult mothers aged 19–21), compared with 36% for families with a mother aged 22 or older (Table 1). Families with a teen mother or mother aged 22 or older were equally likely to have a secondary caregiver living in the home (57% and 59% respectively), while families with a young adult mother were less likely to have a secondary caregiver (52%) The majority of teen-mother families had another adult (other than the primary or secondary caregiver) living in the home (51%), compared with

TABLE 1
Household, child and family characteristics among investigated families[a] where the primary caregiver was the biological mother, 2003 and 2008

Characteristics	Age of mother, years					
	≤ 18		19–21		≥ 22	
	N	%	N	%	N	%
Total families	284		800		5752	
Age of mother, years						
< 16	15	5.3	–	–	–	–
16–18	269	94.7	–	–	–	–
19–21	–	–	800	100.0	–	–
22–30	–	–	–	–	3170	55.1
31–40	–	–	–	–	2269	39.4
≥ 41	–	–	–	–	313	5.4
Age of child, years						
Infant	209	73.6*	382	47.8*	1265	22.0
1	55	19.4	222	27.8*	1021	17.8
2	15	5.3*	113	14.1	943	16.4
3	5	1.8*	49	6.1*	836	14.5
4–5	x	x	34	4.3*	1687	29.3
Sex of child						
Girl	133	46.8	376	47.0	2848	49.5
Main source of household income[b]						
Social assistance/other benefit/none	187	67.8*	448	57.4*	1984	36.0
Multiple jobs/seasonal work/employment insurance	8	2.9*	65	8.3*	345	6.3
Part-time work	24	8.7	57	7.3	388	7.0
Full-time work	57	20.7*	211	27.0*	2796	50.7
Secondary caregiver lives in household	162	57.0	418	52.3*	3366	58.5
Other adult(s) lives in household[c]	144	50.7*	230	28.8*	872	15.2
Home overcrowded	38	13.4*	56	7.0	361	6.3
Number of moves in past year[d]						
0	72	32.6*	189	32.1*	2468	57.2
1	75	33.9	231	39.3*	1212	28.1
2	30	13.6*	82	13.9*	372	8.6
≥ 3	44	19.9*	86	14.6*	260	6.0

Source: Canadian Incidence Study of Reported Child Abuse and Neglect, 2003 and 2008.

Note: Estimates based on youngest biological child if more than one child in family was investigated.

[a] The study only included families with one or more children under the age of 6 years. If there was more than one child under the age of 6, we selected the youngest biological child.

[b] Missing cases for main source of household income excluded (n = 8 mothers aged ≤ 18 years; n = 19 mothers aged 19–21 years; n = 239 mothers ≥ 22 years).

[c] Excluding primary and secondary caregivers.

[d] Missing cases for number of moves excluded (n = 63 mothers ≤ 18 years; n = 212 mothers 19–21 years; n = 1440 mothers ≥ 22 years).

* Significantly different from mothers ≥ 22 years ($p < .05$).

x Cell count less than 5.

29% for families with a young adult mother and 15% for families where the mother was 22 or older. In 72% of the teen-mother families with another adult in the home, the other adult was a grandparent (data not shown). Teen-mother families were more likely to live in overcrowded conditions and both teen-mother families and families with a young adult mother were more likely to report multiple moves over the past year.

Young mothers were more likely than those aged 22 or older to have risk factors, including alcohol and drug abuse, cognitive impairment, and having few social supports, noted by the investigating child welfare worker (Table 2). Teen mothers were more likely than young adult mothers to have these risk factors noted. Mothers in all three groups were equally likely to be assessed as having mental health issues and being victims of domestic violence. Mothers aged 22 or older were more likely to be reported as having physical health issues. Young mothers were more likely to have had a history of foster care or living in a group home (31% among teen mothers and 23% among young adult mothers) compared with 10% for mothers aged 22 or older. Having multiple risk factors was more common among young mothers; 3 or more risk factors were noted among 30% of teen mothers and 29% of young adult mothers compared with 23% of mothers aged 22 or older.

In families where a secondary caregiver lived in the home (Table 3), this was most often the biological father (61% for teen mothers, 69% for young adult mothers and 77% for mothers aged 22 or older). The grandmother was the second most common secondary caregiver for teen-mother families (25%) and a stepfather/partner of the mother in families with a young adult mother (13%) and families with a mother aged 22 or older (17%). Secondary caregivers in families with a young mother were more likely to have risk factors noted by the child welfare worker including alcohol and drug abuse, cognitive impairment, having few social supports and/or having a history of living in foster care/group home. In all cases, secondary caregivers in teen-mother families were more likely than those in families with a young adult mother to have these risk factors noted. Secondary caregivers were equally likely in all family types to be reported as having mental and physical health issues. More than one-quarter (27%) of secondary caregivers in teen-mother families had 3 or more risk factors reported, compared with 23% for secondary caregivers in families with a young adult mother and 14% in families with a mother 22 years or older.

Children in families with a teen mother were more likely to be subjects of risk investigations than those in families with a mother aged 22 or older (31% vs. 17%; Table 4). Substantiation of risk investigations was equally likely among the three family types. Although children in teen-mother families were less likely to be subjects of maltreatment investigations compared with children in families with a mother aged 22 or older, maltreatment was equally likely to be substantiated. Children in families with a teen or young adult mother were more likely to be investigated for neglect while children in families with a mother aged 22 or older were more likely to be investigated for physical and sexual abuse. The same relationship was observed when the analysis was restricted to families where the child was two years old or younger (data not shown).

Emotional maltreatment investigations were more common among families with a young adult mother compared with children with mothers aged 22 or older (18% vs. 15%). Exposure to intimate partner violence was less likely to be investigated among children with a teen mother (20%) than children with a mother aged 22 or older (29%), while this type of investigation was more likely for children with a young adult mother (33%). The same relationship was observed when the analysis was restricted to families in which there was a biological father or mother's intimate partner living in the home (data not shown). For all five individual maltreatment types, substantiation of investigated maltreatment was equally likely to

TABLE 2
Mothers' risk factors among investigated families[a] where the primary caregiver was the biological mother

Risk factors	Age of mother, years					
	≤ 18		19–21		≥ 22	
	N	%	N	%	N	%
Total families	284		800		5752	
Alcohol abuse	72	25.4*	184	23.0*	1051	18.3
Drug/solvent abuse	94	33.1*	229	28.6*	1069	18.6
Cognitive impairment	48	16.9*	92	11.5*	414	7.2
Mental health issues	69	24.3	212	26.5	1403	24.4
Physical health issues	10	3.5*	40	5.0*	427	7.4
Few social supports	131	46.1*	327	40.9*	2106	36.6
Victim of domestic violence	103	36.3	359	44.9	2414	42.0
History of foster care/group home[b]	55	30.9*	112	23.3*	347	10.0
Total number of risk factors reported[c]						
0	51	18.0*	164	20.5*	1661	28.9
1	86	30.3	231	28.9	1561	27.1
2	63	22.2	172	21.5	1207	21.0
≥ 3	84	29.6*	233	29.1*	1323	23.0

Source: Canadian Incidence Study of Reported Child Abuse and Neglect, 2003 and 2008.

[a] The study only included families with one or more children under the age of 6 years.

[b] Only asked in 2008 (n = 178 mothers aged ≤ 18 years; n = 480 mothers aged 19–21 years; n = 3479 mothers aged > 22 years).

[c] Based on 7 items (alcohol abuse, drug/solvent abuse, cognitive impairment, mental health issues, few social supports, victim of domestic violence, physical health issues).

* Significantly different from mothers ≥ 22 years ($p < .05$).

TABLE 3
Characteristics of secondary caregiver among investigated families[a] where the primary caregiver was the biological mother

	Age of mother, years					
	< 18		19–21		≥ 22	
	N	%	N	%	N	%
Total families[b]	162		418		3366	
Relationship of secondary caregiver to child[c]						
Biological father	99	61.1*	287	69.3*	2577	76.9
Stepfather/male partner of mother	11	6.8*	52	12.6*	576	17.2
Grandmother	40	24.7*	50	12.1*	100	3.0
Other male	8	4.9*	16	3.9*	52	1.6
Other female	x	x	9	2.2	45	1.3
Alcohol abuse	59	36.4*	121	28.9*	826	24.5
Drug/solvent abuse	65	40.1*	145	34.7*	674	20.0
Cognitive impairment	21	13.0*	38	9.1*	198	5.9
Mental health issues	24	14.8	52	12.4	434	12.9
Physical health issues	11	6.8	19	4.5	185	5.5
Few social supports	65	40.1*	132	31.6*	883	26.2
Victim of domestic violence	21	13.0	57	13.6*	318	9.4
History of foster care/group home[d]	14	13.2*	31	11.2*	123	5.8
Perpetrator of domestic violence	42	25.9*	153	36.6	1207	35.9
Total number of risk factors reported[e]						
0	50	30.9*	164	39.2*	1607	47.7
1	31	19.1	98	23.4	782	23.2
2	37	22.8*	58	13.9	501	14.9
≥ 3	44	27.2*	98	23.4*	476	14.1

Source: Canadian Incidence Study of Reported Child Abuse and Neglect, 2003 and 2008.

Note: Estimates based on youngest biological child if more than one child in family was investigated.

[a] The study only included families with one or more children under the age of 6 years. If there was more than one child under the age of 6, we selected the youngest biological child.

[b] Among families where secondary caregiver lives in the household.

[c] Excludes cases where the relationship to the secondary caregiver is missing (n = 4 mothers 19–21 years and n = 16 mothers ≥ 22 years).

[d] Only asked in 2008 (n = 106 mothers ≤ 18 years; n = 276 mothers 19–21 years; n = 2133 mothers ≥ 22 years).

[e] Based on 7 items (alcohol abuse, drug/solvent abuse, cognitive impairment, mental health issues, few social supports, victim of domestic violence, physical health issues).

* Significantly different from mothers ≥ 22 years ($p < .05$).

x Cell count less than 5.

occur for children in the three groups of families (Table 4).

Among families where the youngest child was substantiated for maltreatment, a child welfare worker was more likely to refer those with a young mother (teen or young adult) than those with a mother aged 22 or older for use of a parent support group and in-home family or parent counselling (Table 5). Referrals for welfare or social assistance were more common for teen-mother families, and medical and dental services for families with a young adult mother. Referrals for domestic violence services were less likely for families with a teen mother. The same pattern (approximately equal domestic violence referrals for young adult mother and comparison mother families; fewer for teen mother families) was seen when the analysis was restricted to families in which there was a biological father or mother's intimate partner living in the home (data not shown). Family members in all three groups were equally likely to be referred for drug or alcohol counselling, food bank or shelter services, and psychiatric/psychological services.

Among families with a young mother where alcohol or drug abuse were noted for either the mother or the secondary caregiver, less than one-third were referred for drug or alcohol counselling (26% for teen-mother families, 29% for families with a young adult mother, 31% for families with mother aged 22+). Among families with young mothers where mental health issues were noted for either the mother or the secondary caregiver, less than one-quarter were referred for psychiatric/psychological services (19% for teen-mother families, 24% for families with a young adult mother, 23% for families with mother aged 22+) (data not shown).

As part of the investigation, children in families with a teen mother were more likely to be physically examined by a physician or nurse than children in the comparison group. Out-of-home placement of the child during the investigation was more common among families with a young mother (teen or young adult) than in families with a mother aged 22 or older (29% and 27% vs. 17%). Families with a teen mother were less likely to have police involved in an adult domestic violence investigation, and this relationship was maintained when the analysis was restricted to families in which a biological father or mother's intimate partner was living in the home (data not shown). All three groups were equally likely to have police involvement in a child maltreatment investigation.

Discussion

The members of families investigated by child welfare services are at high risk of experiencing violence, mental health and substance abuse issues, and other difficulties. In this pooled sample of high-risk Canadian families identified in 2003 or 2008, we analyzed, by mother's age, risk-related variables in the following domains: household, child and family characteristics; mothers' and secondary caregivers' risk factors; services referred and used. Within all domains, an age gradient was evident, with families with the youngest mothers most at risk. However, there was no clear evidence of a mother's age gradient with regard to types of substantiated

TABLE 4
Type of investigation(s) for youngest child[a] among investigated families where the primary caregiver was the biological mother

	Age of biological mother, years, in investigated cases						Age of biological mother, years, in Substantiated cases					
	≤ 18		19–21		≥ 22		≤ 18		19–21		≥ 22	
	N	%	N	%	N	%	N	%[d]	N	%[d]	N	%[d]
Total	284		800		5752							
Risk investigation[b]	89	31.3*	146	18.3	974	16.9	31	34.8	46	31.5	260	26.7
Maltreatment investigation	195	68.7*	654	81.8	4778	83.1	111	56.9	360	55.0	2462	51.5
Type of maltreatment investigation[c]												
Neglect	129	45.4*	359	44.9*	2075	36.1	65	50.4	159	44.3	968	46.7
Exposure to intimate personal violence	56	19.7*	262	32.8*	1680	29.2	36	64.3	189	72.1	1192	71.0
Emotional maltreatment	38	13.4	142	17.8*	854	14.8	20	52.6	72	50.7	385	45.1
Physical abuse	25	8.8*	67	8.4*	1047	18.2	8	32.0	12	17.9	304	29.0
Sexual abuse	x	x	11	1.4*	301	5.2	x	x	x	x	51	16.9

Source: Canadian Incidence Study of Reported Child Abuse and Neglect, 2003 and 2008.

[a] The study only included families with one or more children under the age of 6 years. If there was more than one child under the age of 6, we selected the youngest biological child.

[b] Risk investigations only collected in 2008.

[c] Based on primary, secondary and tertiary investigations.

[d] Number substantiated divided by number investigated.

* Significantly different from mothers aged ≥ 22 years ($p < .05$).

x Cell count less than 5.

maltreatment, and the relationship between mother's age and intimate partner violence was complex.

Unlike other samples, in which younger couples are more inclined to report violence than are older couples,[14,15] the youngest mothers in this child welfare sample were not more likely to have been victims of domestic violence. We suggest that this finding was not due to the presence or absence of an intimate partner but rather because another adult was present in the home, the most common situation in the teen-mother families. Although the potential for violence in teen-mother intimate partnerships may be high, the presence of another adult may reduce the expression of violence between intimate partners.

The age gradient for one risk factor for mothers was particularly strong: 10% of mothers aged 22 years and older had a noted or suspected history of living in foster care or a group home; this was the case for more than 20% of 19- to 21-year-old mothers and for more than 30% of mothers younger than age 18 years. A significant but weaker age gradient was seen for secondary caregivers. Time spent in foster care or a group home suggests a childhood history of maltreatment. The links between a history of maltreatment and early parenthood have been previously explored.[16-18] Using data from a longitudinal sample of 1000 American adolescents observed since 1988, Thornberry et al.[19] found that their maltreatment while growing up (including witnessing severe domestic violence) was a risk factor for a substantiated report of their maltreating a child before age 33 years. Precocious transitions to adulthood (i.e. living with a partner before age 19; becoming a parent before age 20) were associated with a fourfold increased risk of committing maltreatment in this mostly male sample.[19]

Thus, for the young mothers and the secondary caregivers described in this sample, personal histories of childhood maltreatment may be associated with both their early parenthood and their involvement with child welfare services. An early intervention program with young mothers like the one in this sample may be more efficient, more cost-effective and less stigmatizing than child welfare interventions that, by definition, can only occur once someone has become concerned and made a report to child welfare services.

A gradient by mothers' age was seen in noted alcohol or drug problems, with the youngest mothers and the secondary caregivers in families with young mothers most likely to have these problems. But referrals to drug/alcohol counselling were equally likely in the groups. It is possible that the mothers and secondary caregivers in young families should be more often referred for such services. However, it is also possible that they are not referred more often because they are already enrolled or because needed services are not available in their communities in ways that are accessible to these young families.

Our study has implications for exploring potentially unmet service needs and how to best address them. In addition, our analysis also has implications for potential diversion of families from initial child welfare involvement. Successful diversion from child welfare involvement would involve prevention of initial child maltreatment, and, ideally, prevention also of risk factors that might lead to referrals to child protection. Given that the youngest mothers may have multiple needs and stresses that would make it difficult for them to reach out to community supports and services, programs intended to prevent maltreatment may need to be proactive in reaching mothers at risk. Mothers who are able to reach out to support services (e.g. to bring their infants to a drop-in centre) may

TABLE 5
Publicly funded services used/referred among investigated families[a] where the primary caregiver was the biological mother and the youngest child was substantiated for maltreatment

	Age of mother, years					
	≤ 18		19–21		≥ 22	
	N	%	N	%	N	%
Total families where youngest child substantiated for maltreatment	111		360		2462	
Service referrals for any family member						
Parent support group	29	26.1*	62	17.2*	298	12.1
In-home family or parent counselling	30	27.0*	80	22.2*	438	17.8
Drug or alcohol counselling	20	18.0	78	21.7	457	18.6
Welfare or social assistance	20	18.0*	26	7.2	124	5.0
Food bank	x	x	21	5.8	129	5.2
Shelter services	10	9.0	27	7.5	172	7.0
Domestic violence services	17	15.3*	89	24.7	607	24.7
Psychiatric or psychological services	10	9.0	42	11.7	293	11.9
Medical or dental services	5	4.5	29	8.1*	118	4.8
Child physically examined by a physician/ nurse	23	20.7*	48	13.3	276	11.2
Placement during investigation[b]						
Placement made	31	29.0*	93	27.3*	369	16.5
Placement considered	7	6.5*	x	x	44	2.0
No placement required/considered	69	64.5*	246	72.1*	1820	81.5
Police involvement in adult domestic violence investigation						
Investigation only	13	11.7	59	16.4	358	14.5
Charges being considered	x	x	5	1.4	73	3.0
Charges laid	14	12.6*	92	25.6	584	23.7
No police involvement	83	74.8*	204	56.7	1447	58.8
Police involvement in child maltreatment investigation						
Investigation only	16	14.4	39	10.8	267	10.8
Charges being considered	x	x	x	x	46	1.9
Charges laid	x	x	9	2.5	99	4.0
No police involvement	89	80.2	311	86.4	2050	83.3

Source: Canadian Incidence Study of Reported Child Abuse and Neglect, 2003 and 2008.

[a] The study only included families with one or more children under the age of 6 years. If there was more than one child under the age of 6, we selected the youngest biological child.

[b] Excludes cases (n = 23 mothers < 22 years and n = 229 mothers ≥ 22 years) from 2008 where limited information on placement was collected in some sites.

* Significantly different from mothers ≥ 22 years ($p < .05$).

x Cell count less than 5.

differ in important ways from mothers who most need support services.

Over two decades of follow-up in the United States has shown that the Nurse–Family Partnership (NFP) program reduces a variety of poor outcomes, including maternal and child mortality.[20] NFP is an intensive program of home visiting in which specially trained public health nurses work with first-time young mothers, beginning prenatally and ending at the child's second birthday.[21] All NFP mothers consent to enrol and, within this voluntary framework, each is actively engaged by her nurse. Randomized controlled trials in the United States demonstrated that the NFP reduces state-verified reports of child maltreatment[22] and risk factors for child maltreatment.[21,23] A randomized controlled trial of NFP is currently underway in British Columbia to determine if NFP is effective within a Canadian context.[24] As a complement to the randomized controlled trial, the Public Health Agency of Canada has commissioned a process evaluation to understand *how* and *why* the NFP succeeds, or fails, within different contexts within British Columbia.

Compared to other families involved in child welfare, families with young mothers are more likely to demonstrate risk factors that can be modified by an intervention programs. Young mother families have needs that, if an effective intervention had been delivered to them sooner, might never have become so pressing that child welfare services needed to become involved. Fallon et al.[10] noted that ongoing service provision following a child protection investigation was more likely for young mothers, and provision of such services has costs. Future work may usefully explore the cost benefit ratio (in terms of both financial and human costs) of targeted early provision of prevention services to families most at risk, versus later provision of child welfare intervention services. Early interventions to support young mothers dealing with substance abuse and mental health issues may not only avoid future child welfare investigations but also result in long-term health benefits to the mothers. Such information may prove useful to anyone considering whether or not a program is cost-effective to implement.

Strengths and limitations

Because women's reproductive history was not assessed in the CIS, a limitation of these analyses is that some of the mothers aged 22 years and older may have been teen mothers at an earlier phase of their lives. We were not able to examine characteristics of families in which the mothers were once teen mothers. As well, the measure of socioeconomic status available in this data set was limited, and our analyses could not consider potential effects of social and cultural support for early childbearing on the risk factors assessed in the CIS. In addition, we assumed that simple random sampling was used to select the sample; this assumption likely means that we have underestimated the variance in our estimates.

A strength of our research is that the comparison group we used for teen and

young adult mothers involved with child welfare services was other mothers involved with child welfare services. In addition, we made the groups as similar as possible by restricting analyses to families with young children. Young mothers involved with child welfare services may be very different from young mothers described in surveys representative of the general population. In terms of young mothers' use of alcohol, for example, data from 2005–2008 indicate that mothers in the 20- to 24-year age group (the youngest available) are as or less likely than older mothers to report alcohol consumption during pregnancy (8% vs. an average across all available age groups of 11%).[3] In contrast, many of the young mothers in the sample we used were noted for alcohol abuse problems. Understanding the needs of these young families is enhanced by comparing them with a group that is involved with child welfare services, rather than the general population.

References

1. Koniak-Griffin D, Turner-Pluta C. Health risks and psychosocial outcomes of early childbearing: a review of the literature. J Perinat Neonat Nurs. 2001;15(2):1-17.

2. Jutte DP, Roos NP, Brownell MD, Briggs G, MacWilliam L, Roos LL. The ripples of adolescent motherhood: social, educational, and medical outcomes for children of teen and prior teen mothers. Acad Pediatr. 2010;10(5):293-301.

3. Public Health Agency of Canada. Perinatal health indicators for Canada 2013. Ottawa (ON): Public Health Agency of Canada; 2013.

4. Statistics Canada. Table 2-2: live births, by geography – age of mother [Internet]. Ottawa (ON): Statistics Canada; 2009 [cited 2015 Feb 26]. [Statistics Canada, Catalogue No.: 84F0210X]. Available from: http://www.statcan.gc.ca/pub/84f0210x/2009000/t003-eng.htm

5. Sherraden MS, Gonzalez R, Rainford W. Hacia un futuro más seguro: pregnancy and childbearing among Latina adolescents. In: Holgate HS, Evans R, Yuen FKO editors. Teenage pregnancy and parenthood: global perspectives, issues, and interventions. New York (NY): Routledge; 2006. pp. 36-57.

6. MacMillan HL, Tanaka M, Duku E, Vaillancourt T, Boyle MH. Child physical and sexual abuse in a community sample of young adults: results from the Ontario Child Health Study. Child Abuse Negl. 2013;37(1):14-21.

7. Tonmyr L, Williams G, Jack SM, MacMillan HL. Infant placement in Canadian child maltreatment-related investigations. Int J Ment Health Addict. 2011;9:441-59.

8. Williams G, Tonmyr L, Jack SM, Fallon B, MacMillan HL. Determinants of maltreatment substantiation in a sample of infants involved with the child welfare system. Child Youth Serv Rev. 2011;33:1345-53.

9. Superle T. Family violence against children and youth. In: Juristat: Family violence in Canada: A statistical profile, 2013. Ottawa (ON): Canadian Centre for Justice Statistics; 2015. [Statistics Canada, Catalogue No.: 85-002-X]p. 39-54.

10. Fallon B, Ma J, Black T, Wekerle C. Characteristics of young parents investigated and opened for ongoing services in child welfare. Int J Ment Health Addict. 2011;9(4):365-81.

11. Public Health Agency of Canada. Canadian Incidence Study of Reported Child Abuse and Neglect-2008: major findings. 2010. Ottawa (ON): Public Health Agency of Canada; 2010.

12. Trocmé N, Fallon B, MacLaurin B, et al. Canadian Incidence Study of Reported Child Abuse and Neglect - 2003: major findings. Ottawa (ON): Public Health Agency of Canada; 2005.

13. Dumais J. Comparison and assessment of CIS 1998, 2003 and 2008 Designs. 2010. Statistics Canada. Unpublished report.

14. Al-Sahab B, Heifetz M, Tamim H, Bohr Y, Connolly J. Prevalence and characteristics of teen motherhood in Canada. Maternal Child Health. 2012;16(1):228-34.

15. Sinha M. Family violence in Canada: a statistical profile 2011. Juristat. Statistics Canada, Canadian Centre for Justice Statistics; 2013. [Statistics Canada, Catalogue No.: 85-002].

16. Cederbaum JA, Putnam-Hornstein E, King B, Gilbert K, Needell B. Infant birth weight and maltreatment of adolescent mothers. Am J Prev Med. 2013;45(2):197-201.

17. Noll JG, Shenk CE. Teen birth rates in sexually abused and neglected females. Pediatrics. 2013;131(4):e1181-7.

18. Valentino K, Nuttall AK, Comas M, Borkowski JG, Akai CE. Intergenerational continuity of child abuse among adolescent mothers: authoritarian parenting, community violence, and race. Child Maltreat. 2012;17(2):172-81.

19. Thornberry TP, Matsuda M, Greenman SJ, et al. Adolescent risk factors for child maltreatment. Child Abuse Negl. 2014;38(4):706-22.

20. Olds DL, Kitzman H, Knudtson MD, Anson E, Smith JA, Cole R. Effect of home visiting by nurses on maternal and child mortality: results of a 2-decade follow-up of a randomized clinical trial. JAMA Pediatr. 2014;168(9):800-6.

21. Olds DL. The Nurse-Family Partnership: an evidence-based preventive intervention. Infant Ment Health J. 2006;27:5-25.

22. Zielinski DS, Eckenrode J, Olds DL. Nurse home visitation and the prevention of child maltreatment: Impact on the timing of official reports. Dev Psychopathol. 2009;21:441-53.

23. Olds DL, Sadler S, Kitzman H. Programs for parents of infants and toddlers: recent evidence from randomized trials. J Child Psychol Psychiatry. 2007;48:355-91.

24. Jack SM, Catherine N, Gonzalez A, et al. Adapting, piloting and evaluating complex public health interventions: lessons learned from Nurse–Family Partnership in Canadian public health settings. Health Promot Chronic Dis Prev Can. 2015;35(8/9):151-9.

Adapting, piloting and evaluating complex public health interventions: lessons learned from the Nurse–Family Partnership in Canadian public health settings

S. M. Jack, RN, PhD (1, 2, 3); N. Catherine, PhD (4); A. Gonzalez, PhD (2, 5); H. L. MacMillan, MD (2, 3, 5, 6); D. Sheehan, RN, MSW (4); C. Waddell, MD (4); for the British Columbia Healthy Connections Project Scientific Team

This article has been peer reviewed.

Tweet this article

Abstract

Introduction: The Nurse–Family Partnership (NFP) is a home-visit program for young and first-time, socially and economically disadvantaged mothers. Evidence from three United States randomized controlled trials (RCTs) on the effectiveness of this intervention at improving pregnancy outcomes, improving child health and development, and increasing maternal economic self-sufficiency is robust. However, the effectiveness of the NFP in Canada, with its different health and social care context, needs to be determined. The purpose of this article is to describe the complex process for moving the NFP from the research arena to full implementation in Canada.

Methods: This process of evaluation in Canada includes (1) adapting the intervention; (2) piloting the intervention in small-scale feasibility and acceptability studies; and (3) conducting an RCT and process evaluation through a study called the British Columbia Healthy Connections Project (BCHCP). This large-scale evaluation also creates an opportunity to expand the NFP evidence base by conducting an additional study to examine potential biological mechanisms linking intervention and behavioural outcomes in children.

Results: Adaptation of the NFP home-visit materials is a continuous process. A pilot project determined that it was feasible to enrol eligible women into the NFP. This pilot also determined that, in Canada, it was most appropriate for public health agencies to implement the NFP and for public health nurses to deliver the intervention. Finally, the pilot showed that this intensive home-visit program was acceptable to clients, their family members and health care providers.

Through the BCHCP, the next steps—the RCT and process evaluation—are currently underway. The BCHCP will also set the foundation for long-term evaluation of key public health outcomes in a highly vulnerable population of families.

Keywords: intervention studies, prevention, public health nursing, home visits, child maltreatment

Key findings

- The effectiveness of the Nurse–Family Partnership program has been established in the United States.
- This complex public health intervention, which improves the lives of vulnerable first-time mothers and their families, requires adaptation, piloting and an evaluation of both outcomes and process in this new context prior to implementation in Canada.

Introduction

The goal of delivering evidence-based public health interventions that focus on promoting health and preventing poor health and social outcomes is preceded by a complex process of developing, piloting and evaluating promising interventions or programs. The purpose of this article is to describe the multistep process underway in Canada to adapt, pilot and evaluate the Nurse–Family Partnership (NFP) home visitation program. This public health intervention was shown to be effective at improving pregnancy outcomes, child health and development and maternal economic self-sufficiency among socially and economically disadvantaged first-time mothers and their children in the United States (US). However, the effectiveness of this home visitation program has yet to be established within the Canadian public health and social care systems. A key priority for evaluating and implementing the NFP in Canada is to measure and address important child mental health outcomes, including the prevention of child abuse and neglect.

Child maltreatment, which includes all types of child abuse and neglect, remains a major public health problem in Canada,

Author references:

1. School of Nursing, McMaster University, Hamilton, Ontario, Canada
2. Offord Centre for Child Studies, McMaster University, Hamilton, Ontario, Canada
3. Department of Clinical Epidemiology & Biostatistics, McMaster University, Hamilton, Ontario, Canada
4. Children's Health Policy Centre, Simon Fraser University, Vancouver, British Columbia
5. Department of Psychiatry and Behavioural Neurosciences, McMaster University, Hamilton, Ontario, Canada
6. Department of Pediatrics, McMaster University, Hamilton, Ontario, Canada

Correspondence: Susan Jack, HSC 2J32, 1280 Main Street West, School of Nursing, McMaster University, Hamilton, ON L8S 4K1; Tel: 905-525-9140, ext. 26383; Email: jacksm@mcmaster.ca

despite efforts to reduce its occurrence. Results from a recent national survey suggest that approximately one-third of the Canadian population have experienced one or more types of child maltreatment.[1] Afifi et al.[1] also reported that there is a dose-response relationship between exposure to child abuse and the development of mental health conditions.

Home visiting has been promoted for more than three decades as an approach to preventing child abuse and neglect. During the 1980s, following the pilot results of the Hawaii Healthy Start program,[2] home visiting by paraprofessionals was widely implemented in Canada and the US; it was considered the primary approach to preventing child maltreatment. With greater emphasis on rigorous methods for evaluating outcomes over the next two decades, it became clear that home visiting programs were not uniformly effective in preventing child maltreatment and associated outcomes such as injuries. The NFP, however, was the one with the best evidence for preventing child abuse and neglect, based on official child protection reports and associated outcomes such as injuries.[3]

The NFP is a program aimed at socially and economically disadvantaged first-time mothers. It begins during their pregnancy and continues until the child is two years old. The findings from three US randomized controlled trials (RCTs) have shown the NFP as having a wide range of benefits for maternal and child health, including prevention of child abuse and neglect.[4] Most recently, results of a follow-up of the RCT conducted in Memphis showed a reduction in all-cause mortality among visited mothers and in preventable-cause child mortality when the children reached 20 years of age.[5] In addition, in 2004 the Washington State Institute for Public Policy estimated, based on data from the three RCTs, that society experiences a return on investment of $17 000 USD for every family served by the NFP.[6]

Methods

Following these positive findings, efforts began more than a decade ago to bring NFP to Canada as a strategy to prevent child maltreatment and improve children's mental health and development as well as the lives of disadvantaged first-time mothers. However, it could not be assumed that the positive US findings would be replicated in Canada, especially in light of our policy, socioeconomic, demographic and geographic differences. For example, Canada offers more generous baseline public programs including health care, income supports and child benefits, with near-universal coverage for the lowest-income mothers. In keeping with these concerns, Dr. David Olds, the program developer, requires that the NFP not be implemented elsewhere without first undergoing a trial to examine its effectiveness outside of the US.

Olds et al.[7] are strongly committed to adapting the NFP to societies outside the US as long as the outcomes are rigorously evaluated to ensure that the program benefits disadvantaged mothers and children. The Prevention Research Center at the University of Colorado Denver asks that international sites implementing the NFP agree to follow a four-step protocol,[8] outlined in Table 1. This process was adhered to when the *Family-Nurse Partnership Programme* was implemented and evaluated in England. First, a formative evaluation documented the process of implementing the intervention in 10 pilot sites with a focus on determining site fidelity to the model elements.[9] This study was followed by a large-scale RCT to determine overall program effectiveness in England, with results expected to be delivered in 2015. Likewise, in the Netherlands, where the NFP is called *VoorZorg*, similar steps were undertaken to translate and adapt the US guidelines to this new society, followed by a pilot study to assess treatment integrity and the feasibility of delivering the program in this context.[10] This work was followed by an RCT, with published results demonstrating the effectiveness of the NFP, compared to usual care, in reducing intimate partner violence among home-visited mothers.[11]

Table 2 shows a timeline of all activities that relate to the process of adapting, piloting and evaluating the NFP in Canada.

Results

Adaptation of the Nurse–Family Partnership for use in Canada

A strategic first step in introducing the NFP to Canada was the development of a partnership between researchers at McMaster University, Hamilton, Ontario, and senior decision-makers at Hamilton Public Health Services, Hamilton, Ontario. This was the ideal setting to conduct and implement an NFP pilot study because of strong community support for the program, a public health unit with strong evidence-based programs and a partnership with a research team at McMaster University with expertise in conducting evaluations of child maltreatment and family violence interventions. It was determined that the NFP should be delivered through public health and by public health nurses (PHNs) because PHNs historically visit the homes of vulnerable families in the perinatal period. PHNs in most Canadian jurisdictions hold a baccalaureate degree in nursing, which meets one of the core fidelity elements of the NFP intervention model. Identification of a program champion at the local public health unit level was essential for reallocating a portion of existing provincial home-visit funding towards implementing and piloting of the program.[12]

Adapting the NFP materials, including visit-to-visit guidelines (recommendations to guide the content of each visit), nurse

TABLE 1
Protocol for international replication and evaluation of the Nurse–Family Partnership

1. **Adapt** the NFP program to local contexts and populations while ensuring fidelity to the NFP model elements.
2. **Assess feasibility and acceptability** of the adapted program in a small-scale pilot study.
3. **Evaluate** the adapted program in a large-scale RCT.
4. **Expand** the adapted program within that society if the evaluation shows significant positive outcomes.

Abbreviations: NFP, Nurse–Family Partnership; RCT, randomized control trial.

TABLE 2
Timeline for adapting, piloting and evaluating the Nurse–Family Partnership in Canada

Years	Evaluation component	Location	Activities
2008–11	Phase 1: Adaptation	ON	NFP guidelines adapted to include Canadian standards of evidence and updated content.
2008–12	Phase 2, Step 1: Feasibility study	ON	Pilot study to test procedures for recruitment and retention and instruments for collecting clinical and interview data from participants.
2008–12	Phase 2, Step 2: Acceptability study	ON	A qualitative case study to explore the acceptability of the NFP to clients, their families, PHNs and community stakeholders.
2011–ongoing	Phase 3, Step 1: Preparation for RCT adaptation (version 2.0)	ON and BC	Using feedback from Hamilton PHNs and BC nurse leaders, update and revise the NFP Canadian guidelines; further enhance with integration of intimate partner violence and DANCE nurse education modules, guideline facilitators and nurse instructions.
2011–14	Phase 3, Step 2: Preparation for RCT PHN/Supervisor education	BC	Hiring of PHNs and supervisors; complete nurse education; delivery of the NFP to "guiding clients."
2013–18	Phase 3: Large-scale RCT	BC	Identify eligible pregnant women to enroll in BCHCP RCT to compare the NFP to existing services in reducing childhood injuries (primary outcome).
2013–18	Phase 3: Process Evaluation	BC	Consent a purposeful sample of senior public health managers and all NFP PHNs and supervisors to document process for implementing and delivering NFP.
2014–18	Phase 3: Healthy Foundations Study	BC	Identify 300 mother-infant dyads to enroll to measure and determine effect of NFP on biological mechanisms linking intervention and behavioural outcomes in children.

Abbreviations: BC, British Columbia; BCHCP, British Columbia Healthy Connections Project; DANCE, Dyadic Assessment of Naturalistic Caregiver-child Experiences; ON, Ontario; NFP, Nurse–Family Partnership; PHN, public health nurses; RCT, randomized control trial.

instructions, client worksheets and other resources for use during home visits in Canada, has been an ongoing collaborative effort between public health management, the front-line PHNs who provide feedback based on their clinical experiences delivering the NFP, and nurse-researchers (SJ, DS) who integrate nurses' clinical practice knowledge with existing best practices and research evidence. To date, specific content adaptations to the US materials have included:

(1) integration of Canadian standards of practice and best practice guidelines on topics such as immunization schedules, food and nutritional intake recommendations, and injury prevention guidelines;
(2) augmentation of materials to meet identified local needs or priority issues, including meeting recommendations from the Baby-Friendly Initiative to promote breastfeeding;[13]
(3) integration of new NFP innovations, including an intervention to identify and respond to intimate partner violence;[14] and
(4) a tool for observing parent-child interactions called the Dyadic Assessment of Naturalistic Caregiver-child Experiences (DANCE).[15]

In developing guidelines that would be suitable for use in multiple provincial jurisdictions, PHNs are advised to use any local or provincial guidelines that differ from the Canadian guidelines. Considerable attention was paid at the adaptation stage to meet specific formatting requirements including (1) compliance with the Accessibility for Ontarians with Disabilities Act, 2005;[16] (2) conversion of measurements from imperial to metric; (3) integration or substitution of graphics to reinforce Baby-Friendly Initiative principles or to represent the diversity of clients in the Canadian context; and (4) written indication on each document that adaptations were made with permission from the NFP National Service Office. Prior to their use in the field, all adapted materials were sent to the Prevention Research Center at the University of Colorado Denver for review, feedback and approval.

Assessment of NFP's feasibility and acceptability in Canada

The objectives of the feasibility study were to assess if (1) pregnant women who met the NFP eligibility criteria could be referred and enrolled in the program; (2) the program could be delivered with fidelity to the 18 NFP model elements[17] by a public health agency; (3) program-level data could be collected by the implementing agency; and (4) client-outcome data could be collected by the research team. To meet these goals, Jack et al.[18] carried out a mixed methods pilot study in Hamilton between 2008 and 2012 during which 424 prenatal referrals to the Hamilton Public Health Unit were assessed for NFP eligibility. Criteria included young age ($\leq$ 21 years), low income, referral before the end of the 28th week of pregnancy and first-time birth. A total of 135 pregnant women were deemed eligible for NFP (32% of all prenatal referrals), and 108 (80% of those who were eligible) consented to participate in the pilot study. Additional details of the pilot study methods are reported elsewhere.[18]

Of the 108 participants, 5 refused further contact and 1 was lost to follow-up prior to their baseline interview. Of the remaining 102 women, 71 completed the final interview at age 2 years. Most women (87%) were enrolled in the program before or at 25 weeks' gestation (the international benchmark is 60% referred by 16 weeks of pregnancy) and 77% of the participating women were between 16 and 19 years of age.

Results from the pilot study demonstrated that it was feasible to provide the NFP program through public health units; have PHNs deliver the intervention; receive appropriate referrals from community partners; successfully enroll eligible participants; and to home-visit this targeted population of young, low-income first-time mothers.

Comprehensive NFP program data were also collected via NFP nursing assessment forms that elicited systematic information on each mother's health status and health behaviours, the child's health and development, and utilization of other health and community services. A process to collect client-outcome data by the research team was also successfully implemented.

In addition to measuring the feasibility of delivering the program, Jack et al.[18] conducted a qualitative case study to explore the acceptability of delivering the NFP to families in Hamilton. In intervention research, acceptability studies are an important complement to traditional pilot studies of feasibility. Determination of an intervention's acceptability in a new context provides two benefits: (1) it allows for key stakeholders to be engaged early in the process, which may facilitate later uptake of the intervention; and (2) it identifies intervention components that may require additional adaptation to meet the needs of the targeted audience, the health care providers or the local community.[19] An acceptability study focusses on an examination of the local context with the goal of understanding if, how, and under what conditions the intervention will be delivered and received by the intended target audience. In addition, acceptability studies examine if the intervention will meet the needs of the target population and the community.

With the introduction of a new public health intervention into the existing provincial home-visit program, it was important to determine community-level acceptance of and readiness for the NFP. The NFP was quite distinct from Ontario's existing provincial home-visit program in that it is targeted to first-time mothers who are socially and economically disadvantaged, it is delivered by registered nurses with a baccalaureate degree and it provides the client with a greater overall number of home visits, which start early in pregnancy.

In Hamilton, socially and economically disadvantaged mothers who participated in the home visits identified the NFP as an acceptable, early intervention public health initiative.[20] At the organizational level, this intervention created an environment where PHNs could deliver holistic nursing care at their full scope of practice; develop in-depth therapeutic relationships with clients; and have the infrastructure, resources and materials to assess and intervene with clients who experience multiple, complex health and social conditions, including mental health issues and substance misuse, as well as exposure to violence.[20] In addition, community professionals responsible for referring women to the program recognized that the NFP addressed an important gap in health care service delivery for families at greatest risk.[18]

Components of the Nurse–Family Partnership Model in Canada

The Canadian model of the NFP was built upon findings from the Jack et al.[18] case study together with the requirements of the Prevention Research Center at the University of Colorado, Denver and of the NFP National Service Office. Results from the case study conducted in Hamilton informed

(1) the development of the Canadian NFP visit-to-visit guidelines including guidelines and forms for documenting nursing practices;
(2) the recommendation to deliver NFP through public health agencies by PHNs;
(3) recommendations for hiring and staffing, including caseload levels; and
(4) the importance of a staged implementation, with nurses first carrying a small caseload of "guiding clients" to work with as they engage in and complete the NFP education requirements.

See Table 3 for a summary of the components of the NFP model in Canada.

Setting the stage for large-scale NFP evaluation in Canada

The development and implementation of a large-scale study to evaluate the effectiveness of NFP in Canada required a substantive commitment of funding, research expertise, and community engagement. Attempts to expand the evaluation in Ontario were not successful.[12] In 2010, British Columbia (BC) announced *Healthy Minds, Healthy People: A Ten-Year Plan to Address Mental Health and Substance Use*.[21] In this plan, the BC government prioritized an intervention that featured nurse home visits to disadvantaged first-time mothers and their children as a central initiative. *B.C.'s Guiding Framework for Public Health* also identified nurse visiting the homes of the most vulnerable pregnant women as a promising approach for improving health systems capacity.[22]

Through their ten-year mental health plan,[21] the BC Ministry of Health (MoH) and the Ministry of Children and Family Development (MCFD) jointly invited the Children's Health Policy Centre in the Faculty of Health Sciences at Simon Fraser University (SFU) to explore options for evaluating NFP in BC with McMaster University's NFP pilot study team. The MoH and the MCFD also convened a Provincial Advisory Committee made up of senior representatives from five BC health authorities and from MCFD regions, Aboriginal organizations and other agencies, such as the Public Health Agency of Canada. These meetings created a venue to present information about the NFP and also allowed the MoH and the MCFD to seek province-wide consensus on proceeding with the NFP evaluation.

With funding from the MoH and support from the MCFD, the BC Healthy Connections Project (BCHCP) officially launched in 2012 in close collaboration with five participating health authorities (Fraser Health, Vancouver Coastal Health, Interior Health, Northern Health and Island Health). Three primary studies now make up the BCHCP: an RCT to evaluate the impact of the NFP on health and social outcomes, including early child mental health and development outcomes and maternal life course; a process evaluation to describe how the NFP is implemented and delivered; and the Healthy Foundations Study to investigate the impact of the NFP on infant biological systems and functioning. Recruitment for these studies commenced in October 2013 and is expected to continue into 2016. Data collection will continue until the participating children reach two years of age.

TABLE 3
Nurse–Family Partnership Canada model components

Components	Nurse–Family Partnership model in Canada
Program goals	Improve pregnancy outcomes Improve child health and development Improve parents' economic self-sufficiency
Eligibility criteria	First-time mothers Aged < 25 years[a] Speak English Meet socioeconomic disadvantage criteria
Referral process	Ideally referred by 16 weeks gestation; must receive first home visit before the 29th week gestation
Professionals delivering home visits	Public health nurses (PHNs)
Frequency of home visits	Prenatal: Weekly for 4 visits then bi-weekly (~14 visits) Infancy: Weekly for 6 visits then bi-weekly (28 visits) Toddler: Once every 2 weeks until 21 months and then monthly for 3 visits (22 visits) Note: If needed, the schedule is adapted to meet the needs of each enrolled participant
Theories used	Human ecology, attachment, self-efficacy
Structure of visits	Emphasis on developing a therapeutic relationship using • 5 client-centred principles (client is the expert on her life; follow the client's heart's desire; only a small change is necessary; focus on strengths; focus on solutions) • 6 content domains (Personal Health, Life Course Development, Maternal Role, Family and Friends, Environmental Health, and Health & Human Services) • motivational interviewing • goal setting • visit-to-visit guidelines (recommendations to guide content of each visit) • client resources left in home (facilitators) • data collection
Use of screening and assessment tools	Standard schedule of assessments. Tools used include • Dyadic Assessment of Naturalistic Caregiver-child Experiences (DANCE) • Ages and Stages Questionnaire • Partners in Parenting Education (PIPE) • Edinburgh Postpartum Depression Scale, Intimate Partner Violence • NFP-specific tools
Education	Comprehensive core NFP education provided with a combination of self-study, team-based learning, webinars, and in-person About 20 days for PHNs plus an additional 5.5 days for supervisors
Caseload	Maximum of 20 clients for a full-time PHN
Clinical supervision	Structured approach to clinical and reflective supervision including weekly individual case consultations and regular home-visit observations. Ratio of NFP PHN supervisors to PHNs is a maximum of 1:8

Abbreviations: BCHCP, British Columbia Healthy Connections Project; NFP, Nurse–Family Partnership; PHN, public health nurse.

[a] To achieve sufficient power to estimate program differences on the primary outcome (childhood injuries), the BCHCP criteria include women aged < 25 years (compared to < 21 years in Hamilton) who are experiencing indicators of socioeconomic disadvantage associated with increased risk for child injuries.

BCHCP randomized controlled trial: evaluation of NFP's effectiveness

The BCHCP includes an RCT to evaluate the effectiveness of NFP across five domains: pregnancy, birth, early child health and development, and maternal life course. Within these domains, the impact of NFP on specific outcomes for both children and mothers, as well as the associated risk and protective factors, will be evaluated. The NFP will be compared to the health and social services existing in BC ("existing services") from early pregnancy until children reach two years of age. As outlined in a recent report discussing the use of RCTs in developing public policy, conducting a trial to determine the effectiveness of the NFP in BC will ensure that the NFP group and the group receiving existing services will be as closely matched as possible.[2,3] Evaluating the NFP with an RCT design allows for greater control over external factors that may otherwise affect findings. The BCHCP RCT study methods are briefly described here.

Women are eligible to participate in the BCHCP RCT if they are socioeconomically disadvantaged first-time mothers (i.e. low education, low income, lone parent) less than 25 years old. The goal is to enroll 1000 women and randomly assign them to either the NFP or existing services. Outcome data will be collected (through interviews and via linkages to administrative health data) at baseline and then at regular intervals until the child's second birthday. Women randomized into the "intervention" arm will be part of the NFP *and* will be eligible to receive existing services within their health authority; women in the "comparison" arm will receive existing services. Existing services vary across the province but may include standard primary health care services; public health programs including prenatal

classes, pregnancy outreach and home visits by non-NFP nurses; and a variety of targeted and universal parenting and early child development programs.

The BCHCP will also be able to provide extensive data to assess BC's existing services. Service use will be tracked across a broad array of health and social sectors over the first two years of the child's life (e.g. maternal and child primary health care, standard perinatal nursing programs, parenting programs, early child development programs, child emergency room visits, child hospitalizations, child protection investigations, child foster care placements, maternal criminal justice system involvement, and family income supports). These service-use data will also be collected during BCHCP interviews and through linkages to administrative health data. Comprehensive NFP program data will be collected via NFP nursing assessment forms. Future papers will provide a detailed analysis of the use of existing services, compared with NFP, in BC.

Based on the US RCT findings, we hypothesize that the primary outcome of the NFP will be to reduce injuries from birth to age two. Secondary outcomes will include

- a reduction in prenatal substance use (i.e. tobacco and alcohol);
- an improvement in child language and cognitive development at age two years;
- an improvement in child behaviour at age two years; and
- an improvement in maternal life course at two years postpartum (i.e. number of subsequent pregnancies).

In addition, we will evaluate associated risk and protective factors (e.g. child physical health, maternal mental health, parenting, socioeconomic status, exposure to intimate partner violence). We are also setting the stage for evaluating the NFP's long-term impact across childhood and into adolescence. Service-use data will specifically enable economic evaluation. As part of defining service utilization comprehensively from a broader societal perspective, we will also gather information about services that were not accessed and the reasons for this. There is ongoing engagement with policy makers at each step of the evaluation. The common goal is to improve the lives of children in BC, starting very early in the lifecourse.

BCHCP process evaluation

The NFP is being delivered across five of BC's health authorities, each of which is unique in its geography, population characteristics, and pre-existing culture of the partnerships and collaborations required to support the NFP at the community level. This level of complexity creates challenges for evaluating both the effectiveness of interventions and for understanding how causal mechanisms of interventions may influence intended outcomes.[24] In addition to measuring trial outcomes, process evaluations are increasingly used with RCTs to contribute to the comprehensive evaluation of complex interventions. This process evaluation will also help us identify barriers to and facilitators of the successful implementation of the NFP in a range of diverse communities. Investigators will also explore strategies for resolving identified challenges related to implementation and delivery.

The primary objectives of the BCHCP process evaluation are to describe, and compare across BC's five participating health authorities

- how the NFP is implemented;
- if the intervention is delivered with fidelity to the NFP model elements;
- the dose of the intervention delivered and received;
- client enrolment and client and PHN retention issues;
- contextual factors at the client, health care provider, organizational and community levels that influence implementation and delivery (including a comparison between urban and rural contexts); and
- how PHNs identify and address issues related to child welfare involvement, intimate partner violence and mental health including substance misuse.

Investigators will evaluate the process evaluation using a convergent parallel mixed methods research design.[25]

All BC PHNs and supervisors employed by their health authority to deliver the NFP as part of their public health responsibilities will be invited to participate in the study. In each health authority, a purposeful sample of 10 to 15 public health managers/directors responsible for BCHCP or the NFP will also be included. To document the implementation processes within each health authority, data will be collected regularly between 2013 and 2018. All PHNs, supervisors and the NFP provincial coordinator will complete an in-depth interview (or participate in a focus group) every six months; public health managers will complete one in-depth interview annually. Documents, including individual supervisor–NFP PHN reflective supervision meetings and team meeting/case conference summary forms, will be completed monthly by supervisors, and the data will be aggregated every 6 months. NFP program fidelity data from the MoH will be collected on a quarterly basis. The collection of both quantitative and qualitative data will bring together the strengths of both research traditions to compare, corroborate and explain results and variances across the five health authorities.

Healthy Foundations Study

Beyond assessing the NFP's effectiveness and the process of its implementation, we also wanted to examine potential biological mechanisms linking intervention and behavioural outcomes in the children. That adverse early experiences (i.e. childhood maltreatment and poverty) have enduring effects on cognitive, mental and physical health outcomes is well established.[26,27] Parallel lines of animal and human research show that early adversity produces long-lasting disruptions in physiology, including alterations in the stress system (hypothalamic-pituitary-adrenal axis)[28,29] and changes in immune system function.[30,31] These changes, in turn, adversely affect brain development and health. Emerging evidence suggests that these experiences may be "biologically embedded" into molecular and genomic systems that determine expressions of vulnerability later in life.[27] These experiences set developmental trajectories that are difficult to reverse later on.[32] To our knowledge, no study has yet examined the impact of preventive interventions longitudinally on biological

outcomes in mothers and their children, nor have any studies assessed whether these interventions can potentially reverse the biological embedding of disease.

In July 2013, we received funding to embed a sub-study (N = 300 dyads; n = 150 in the intervention group; n = 150 in the comparison group) within the BCHCP. This Healthy Foundations Study has three primary aims: (1) to determine whether the NFP has an effect on infant physiological function, as reflected in alterations in hypothalamic–pituitary–adrenal axis function and epigenetic markers; (2) to investigate whether the NFP has an impact on maternal prenatal cortisol levels and whether maternal prenatal cortisol levels are associated with alterations in infants' stress physiology, immune function and DNA methylation; and (3) to examine whether alterations in biological markers explain the association between the impact of the NFP on infant developmental outcomes at age two years. We will collect biological samples from both groups (NFP and existing services) and from mothers (hair) and infants (saliva) to measure levels of stress and immune function. Buccal samples are also collected from infants to examine markers that affect gene expression. A greater understanding of the biology of early adversity and the potential to reverse its detrimental effects (via NFP) provides a powerful framework with which to inform basic and applied research, practice and policy.

Discussion

The NFP holds exceptional promise as a program that can influence very early, crucial determinants of health though prenatal behaviour, parenting and child maltreatment, which in turn influences mental health and learning outcomes in early childhood and beyond. While many public health agencies are primed to implement this public health intervention, the NFP has never been tested in Canada to determine whether we can replicate—and expand on—the outcomes from the US trials.

A systematic approach to adapting the US NFP materials and piloting this public health intervention for feasibility and acceptability laid the groundwork for the subsequent evaluation of effectiveness. The BCHCP is now laying the foundation to evaluate and adapt the NFP for sustained use in BC, work that could potentially be applied to successfully implement the NFP in jurisdictions across Canada. Findings from the process evaluation will inform further adaptations of the Canadian NFP guidelines and core nurse education.

The BCHCP has also created an opportunity to expand the NFP evidence base through the inclusion of the data from the Healthy Foundations Study. Findings from the process evaluation will also influence our understanding of how to adapt the service delivery model to meet the needs of families in rural and remote communities. Perhaps the most unique aspect of the BCHCP is that it is already embedded in BC's health system—as a close collaboration with child health policy makers in the MoH, MCFD and five health authorities—enabling us to evaluate the NFP's effectiveness in "real-world" conditions and also positively influence the care that mothers and children are receiving. Notably, BCHCP policy partners have already committed to adopting the NFP as an ongoing maternal–child health program in BC, should the RCT prove successful.

Conclusion

In 2004, the Prevention Research Center at the University of Colorado Denver, led by Olds, began responding to inquiries from researchers and policy makers outside the US who were interested in implementing NFP in their countries. The Prevention Research Center developed the four-step process (see Table 1) that involves helping international partners adapt and test the NFP in their own societies while maintaining fidelity to the core model elements of the program. Based on evolving understanding of prevention research, we recommend that the Prevention Research Center add the requirement that international sites incorporate a process evaluation in conjunction with the required RCT.

At present, each RCT outside the US is conducted independently and there is no formal mechanism for international NFP researchers to collaborate and consult with each other. As evaluation work on this public health intervention proceeds in different contexts, it is imperative to establish a process for collaborating internationally on different components of the program. Processes have now been put in place for countries implementing the NFP to come together to address shared issues through a Clinical Advisory Committee and a Clinical Leaders Network. Recently, a small international team was developed to support high quality implementation of the NFP in new and existing societies/countries. In October 2014, the first meeting of representatives (education and implementation leads) from seven international NFP societies (Australia, Canada, England, Netherlands, Northern Ireland, Scotland, United States) was held in Denver, Colorado, US. The focus of the meeting included discussion and development of NFP education principles and theories, nurse competencies, and essential (or optional) education content and processes that will inform and ultimately result in an NFP Education Framework. A pre-meeting session explored the process of developing and implementing program innovations such as the DANCE and an intervention aimed at reducing intimate partner violence, both of which are part of the core NFP intervention being evaluated in BC. As this international NFP implementation work proceeds, it is hoped and anticipated that international NFP researchers can also come together to develop a collaborative network.

In BC, we are also setting the stage for following our sample of 1000 children over 10 years or more into middle childhood and adolescence. This will allow us to fully assess the potential impact of NFP on several critical child health and public health outcomes: preventing the most common mental health problems including anxiety, depression, conduct disorder and substance misuse; improving academic achievement; and reducing maltreatment and its consequences. In addition, long-term follow-up will enable us to conduct a detailed economic evaluation of the NFP in Canada for the first time. Perhaps most importantly, we hope to build on the BCHCP to sustain and expand the child-centred approach to public health that has been initiated in BC, leading the way for

other provinces, and allowing us to collaborate with international partners who share our child health goals.

Acknowledgements

Members of the BCHCP Scientific Team include Ronald G. Barr, MA MDCM FRCPC (University of British Columbia); Michael Boyle, PhD (McMaster); Amiram Gafni, DSc (McMaster); Kaitlyn Hougham, MSc (Simon Fraser University); Lenora Marcellus, RN PhD (University of Victoria); Lawrence McCandless, PhD (Simon Fraser University); Cody Shepherd, BA (Hon) (Simon Fraser University); Lil Tonmyr, PhD (Public Health Agency of Canada); Natasha Van Borek, MScPPH (McMaster); and Colleen Varcoe, RN PhD (University of British Columbia). The Public Health Agency of Canada provided funds to adapt the NFP materials. The City of Hamilton Public Health Services funded the feasibility and acceptability studies, with additional funding from two child protection agencies (Hamilton Catholic Children's Aid Society and Hamilton Children's Aid Society), the Hamilton Community Foundation, McMaster Children's Hospital, the Ontario Ministry of Health and Long-Term Care Nursing Secretariat and the Ontario Centre for Excellence for Child and Youth Mental Health. The BC Ministry of Health funds the BCHCP, with support from the BC Ministry of Children and Family Development and from Fraser Health Authority, Interior Health, Island Health, Northern Health and Vancouver Coastal Health. Additional funding has been provided through the Djavad Mowafaghian Foundation. The BCHCP process evaluation received additional funding from the Injury and Child Maltreatment Section, Centre for Chronic Disease Prevention, Public Health Agency of Canada. The Healthy Foundations Study is funded through the Canadian Institutes for Health Research. Harriet MacMillan is supported by the Chedoke Health Chair in Psychiatry. Charlotte Waddell is supported by a Canada Research Chair in Children's Health Policy.

References

1. Afifi TO, MacMillan HL, Boyle M, Taillieu T, Cheung K, Sareen J. Child abuse and mental disorders in Canada. CMAJ. 2014;186(9): E324-32.

2. Duggan AK, McFarlane EC, Windham AM, et al. Evaluation of Hawaii's Healthy Start program. Future Child. 1999;9(1):66-90.

3. MacMillan HL, Wathen CN, Barlow J, Fergusson DM, Leventhal JM, Taussig HN. Interventions to prevent child maltreatment and associated impairment. Lancet. 2009; 373:250-66.

4. Olds DL, Sadler S, Kitzman H. Programs for parents of infants and toddlers: recent evidence from randomized trials. J Child Psych Psychiatry. 2007;48:355-91.

5. Olds DL, Kitzman H, Knudtson MD, Anson E, Smith JA, Cole R. Effect of home visiting by nurses on maternal and child mortality: results of a 2-decade follow-up of a randomized clinical trial. JAMA Pediatr. 2014;168(9):800-6.

6. Aos S, Lieb R, Mayfield J, Miller M, Pennucci A. Benefits and costs of prevention and early intervention programs for youth. Olympia (WA): Washington State Institute for Public Policy; 2004.

7. Olds DL, Hill PL, O'Brien R, Racine D, Moritz P. Taking preventive intervention to scale: The Nurse-Family Partnership. Cogn Behav Pract. 2003;10:278-90.

8. Prevention Research Center for Family and Child Health. Nurse-Family Partnership international program [Internet]. Denver (CO): University of Colorado Denver; [cited 2014 Dec 4]. Available from: http://www.ucdenver.edu/academics/colleges/medicalschool/departments/pediatrics/research/programs/prc/research/international/Pages/international.aspx.

9. Barnes J. From evidence-base to practice: implementation of the Nurse Family Partnership programme in England. J Child Serv. 2010;5:4-17.

10. Mejdoubi J, van den Heijkant S, Struijf E, van Leerdam F, HiraSing R, Crijnen A. Addressing risk factors for child abuse among high risk pregnant women: design of a randomised controlled trial of the nurse family partnership in Dutch preventive health care. BMC Public Health. 2011;11:823.

11. Mejdoubi J, van den Heijkant S, van Leerdam FJ, Heymans MW, Hirasing RA, Crijnen AA. Effect of nurse home visits vs usual care on reducing intimate partner violence in young high-risk pregnant women: a randomized controlled trial. PLoS ONE. 2013;8(10):e78185.

12. Jack SM, MacMillan HL. Adaptation and evaluation of the Nurse-Family Partnership in Canada [Internet]. Early Childhood Matters. 2014 [cited 2014 Nov 24]; 43-46. Available from: http://earlychildhoodmagazine.org/adaptation-and-evaluation-of-the-nurse-family-partnership-in-canada/.

13. Pound CM, Unger SL. The Baby-Friendly Initiative: protecting, promoting and supporting breastfeeding. Paediatr Child Health. 2012;17(6):317-21.

14. Jack SM, Ford-Gilboe M, Wathen CN, et al. Development of a nurse home visitation intervention for intimate partner violence. BMC Health Serv Res. 2012;12:50.

15. Olds D, Donelan-McCall N, O'Brien R, et al. Improving the Nurse-Family Partnership in community practice. Pediatrics. 2013;132: S110-7.

16. Ontario Ministry of Community and Social Services. Accessibility for Ontarians with Disabilities Act [Internet]. Toronto (ON): Ontario Ministry of Community and Social Services; 2014 [cited 2014 Nov 24]. Available from: http://www.ontario.ca/laws/statute/05a11.

17. Nurse-Family Partnership. Nurse-Family Partnership model elements [Internet]. Denver (CO): Nurse-Family Partnership National Service Office; [cited 2014 Nov 24]. Available from: http://www.nursefamilypartnership.org/communities/model-elements.

18. Jack SM, Busser LD, Sheehan D, Gonzalez A, Zwygers EJ, MacMillan HL. Adaptation and implementation of the Nurse–Family Partnership in Canada. Can J Public Health. 2012;103(Suppl 1):S42-8.

19. Ayala GX, Elder JP. Qualitative methods to ensure acceptability of behavioral and social interventions to the target population. J Public Health Dent. 2011;71(01):S69-S79.

20. Landy CK, Jack SM, Wahoush O, Sheehan D, MacMillan HL. NFP Hamilton Research Team. Mothers' experiences in the Nurse-Family Partnership program: a qualitative case study. BMC Nurs. 2012;11:15.

21. British Columbia Ministry of Health and Ministry of Children and Family Development. Healthy minds, healthy people: a ten-year plan to address mental health and substance use in British Columbia. Victoria (BC): Government of British Columbia; 2010.

22. Promote protect. prevent: our health begins here. B.C.'s guiding framework for public health [Internet]. Victoria (BC): Ministry of Health. 2013 [cited 2014 Nov 24]. Available from: http://www2.gov.bc.ca/gov/content/health/about-bc-s-health-care-system/health-priorities/bc-s-guiding-framework-for-public-health.

23. Haynes L, Service O, Goldacre G, Torgerson D. Test, learn, adapt: developing public policy with randomized controlled trials. London (UK): Cabinet Office Behavioural Insights Team; 2012.

24. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M. Developing and evaluating complex interventions: new guidance [Internet]. London (UK): Medical Research Council; 2008 [cited 2014 Nov 24]. Available from: http://www.mrc.ac.uk/documents/pdf/complex-interventions-guidance/

25. Creswell JW, Plano Clark VL. Designing and conducting mixed methods research. 2nd ed. Thousand Oaks (CA): Sage Publications; 2011.

26. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study.Am J Prev Med.1998;14(4):245-58.

27. Shonkoff JP, Garner AS. The Committee on Psychosocial Aspects of Child and Family Health. The lifelong effects of early childhood adversity and toxic stress. Pediatrics. 2012;129:e232-46.

28. Gunnar MR, Donzella B. Social regulation of the cortisol levels in early human development. Psychoneuroendocrinology. 2002; 27:199-220.

29. Repetti RL, Taylor SE, Seeman TE. Risky families: family social environments and the mental and physical health of offspring. Psychol Bull. 2002;128(2):330-66.

30. Danese A, McEwen BS. Adverse childhood experiences, allostatic, allostatic load, and age-related disease. Physiol Behav. 2012; 106(1):29-39.

31. Taylor SE, Karlamangla AS, Friedman EM, Seeman TE. Early environment affects neuroendocrine regulation in adulthood. Soc Cogn Affect Neurosci. 2011;6(2):244-51.

32. Shonkoff JP. Leveraging the biology of adversity to address the roots of disparities in health and development. Proc Natl Acad Sci U S A. 2012;109(2):17302-7.

Health care and social service professionals' perceptions of a home-visit program for young, first-time mothers

S.-A. Li, MSc (1, 2); S. M. Jack, PhD (1, 2, 3); A. Gonzalez, PhD (2, 4); E. Duku, PhD (2, 4); H. L. MacMillan, MD (1, 2, 4, 5)

This article has been peer reviewed.

Tweet this article

Abstract

Introduction: Little is known about health care and social service professionals' perspective on the acceptability of long-term home-visit programs serving low-income, first-time mothers. This study describes the experiences and perspectives of these community care providers involved with program referrals or service delivery to mothers who participated in the Nurse–Family Partnership (NFP), a targeted nurse home-visit program.

Methods: The study included two phases. Phase I was a secondary qualitative data analysis used to analyze a purposeful sample of 24 individual interviews of community care providers. This was part of a larger case study examining adaptations required to increase acceptability of the NFP in Hamilton, Ontario, Canada. In Phase II (n = 4), themes identified from Phase I were further explored through individual, semi-structured interviews with community health care and social service providers, giving qualitative description.

Results: Overall, the NFP was viewed as addressing an important service gap for first-time mothers. Providers suggested that frequent communication between the NFP and community agencies serving these mothers could help improve the referral process, avoid service duplication, and streamline the flow of service access. The findings can help determine key components required to enhance the success of integrating a home-visit program into an existing network of community services.

Conclusion: The function of home-visit programs should not be viewed in isolation. Rather, their potential can be maximized when they collaborate and share information with other agencies to provide better services for first-time mothers.

Keywords: home visits, early intervention, parent education, mothers, Nurse–Family Partnership, community professionals

Key findings

- Community care providers recognized the added value of the Nurse–Family Partnership (NFP) program to existing community services.
- These health care and social service providers also preferred greater collaboration and more frequent communication with NFP to form an integrated network of services for at-risk young mothers, promoting seamless access to community services.

Introduction

Pregnant women with limited financial, psychological and personal resources are at high risk for adverse pregnancy outcomes, including preterm birth or low birth-weight babies.[1,2] Prenatal and early childhood home visits facilitate access to and use of community health and social services by vulnerable pregnant women and families with young children.[3,4] In Canada, it is common practice to offer universal (non-targeted) home visits to new and expectant parents and then more intensive home visits to specific target populations, typically families with children at risk of poor health or social or emotional development.[5]

The Nurse–Family Partnership (NFP) is an evidence-based intervention that was developed based on theories of human ecology,[6] self-efficacy[7] and human attachment.[8] Over the past 35 years, the NFP has been extensively evaluated in a series of three randomized controlled trials (RCTs).[9-11] Once the effectiveness of the intervention in improving pregnancy outcomes as well as maternal and child health and psychosocial well-being was established, the program began to be fully implemented. Currently, eligible families in 43 states plus the United States Virgin Islands are enrolled in the NFP.[11-13]

The NFP developed 18 model elements as a guide for implementing agencies. These model elements ensure that outcomes would be comparable to those measured in the three evaluating RCTs on which the current approach to scaling up the program is based.[14] Two of the elements specifically refer to the importance of partnerships with other organizations, community support and recognition, and the level of community involvement required to successfully implement programs.[15] Establishing alliances between community stakeholders and organizations

Author references:

1. Department of Clinical Epidemiology & Biostatistics, McMaster University, Hamilton, Ontario, Canada
2. Offord Centre for Child Studies, McMaster University, Hamilton, Ontario, Canada
3. School of Nursing, McMaster University, Hamilton, Ontario, Canada
4. Department of Psychiatry and Behavioural Neurosciences, McMaster University, Hamilton, Ontario, Canada
5. Department of Pediatrics, McMaster University, Hamilton, Ontario, Canada

Correspondence: Shelly-Anne Li, Offord Centre for Child Studies, 1280 Main Street West, Hamilton, ON L8S 4K1; Tel: 416-662-2232; Email: shellyanne.li@gmail.com

from multiple sectors to promote and sustain community health has become an important strategy for meeting community health needs.[16] Home visitors form strong partnerships with other health care and social service professionals (e.g. primary care physicians, pediatricians and social workers), who are providing vital support and essential education to high-risk families within the same community.[17,19] These strong partnerships are thought to improve families' adherence to medical prevention and treatment regimens.[20] Given that local community support is a key element in determining the success of the implementation of the program, it is crucial to understand the perspective of the health care professionals who form the broader support network system in which the NFP is situated.

The NFP has been evaluated in Canada in Hamilton, Ontario,[21,22] and an RCT is currently assessing its effectiveness in British Columbia. In-depth investigations suggest that public health nurses (PHNs) in Canada, as well as the clients receiving the intervention and their families, consider NFP model elements and home visits acceptable.[21,24] However, the perspective of health care and social service professionals who provide the NFP have not been explored. Our study addressed this gap by examining the factors that influence the acceptability of home visitation programs among health care and social service professionals. It takes into account the points of view of professionals who can help inform health administrators about the readiness of the community for an evidence-based home visitation within the Canadian health care system.

Methods

This qualitative study included two distinct phases. Phase I was a secondary analysis of data from a qualitative case study[21] that explored the acceptability of the NFP among young low-income, first-time mothers and their families, PHNs, and community stakeholders, including health care and social service professionals, in Hamilton, Ontario. Because the data used for the secondary data analysis were based on questions posed by investigators in the primary study, the responses may not adequately reflect the research questions from this study.[25] To overcome this limitation, Phase II consisted of additional individual semi-structured interviews with community professionals. These interviews serve as a follow-up to elaborate and confirm Phase I findings. Also, as data from Phase I were collected in 2009, Phase II was undertaken to provide some preliminary indication of whether the findings were still valid in 2014.

Sampling

In Phase I, we included for analysis a subset (n = 24) of the individual interviews of community stakeholders (who included health care and social service professionals). Table 1 shows further demographic characteristics of the sample.

We purposefully sampled Phase II participants to select those who could provide information-rich responses to our research questions. The sample included (1) Children's Aid Society (CAS) professionals who could provide insight into the role of the NFP in the context of child protection services, and (2) Hamilton Public Health Services (HPHS) professionals who could provide in-depth information about the NFP home-visit program in Hamilton. Based on the findings from Phase I, many community care providers were aware of the NFP's influence on the number of CAS referrals received and the timing of closing cases. Professionals were not eligible for participation if they did not have first-hand knowledge of the implementation of the NFP in Hamilton.

We approached 10 social service and health care professionals (3 from HPHS; 7 from CAS) who were considered to have first-hand knowledge of the NFP. Of the 8 participants in the primary study, 4 responded to the invitation email sent by the principal investigator and 3 participated; 2 other individuals were identified through snowball sampling* and invited to participate in our study, and 1 consented. Altogether, 4 social service and health care professionals agreed to participate in this study.

Participants

The 4 participants (3 women and 1 man) had been involved with the NFP since its

TABLE 1
Characteristics of the Phase I sample

Occupation	n (%)
Frontline care providers (team leaders, support workers)	5 (20.8)
Health care professionals (medical doctors, registered nurses)	3 (12.5)
Social service providers (social workers, school liaisons)	6 (25.0)
Decision makers (directors, supervisors, managers)	6 (25.0)
Child protection professionals	3 (12.5)
NFP administrative staff	1 (4.2)
Professional designation	**n (%)**
Registered social worker	17 (70.8)
Medical doctor	2 (8.3)
Registered nurse	2 (8.3)
Other diploma	2 (8.3)
Not provided	1 (4.2)
Other demographics	**Mean (SD)**
Age, years	51.8 (5.3)
Number of years in profession	18.1 (0.5)
Number of years in current position	7.8 (5.5)
Number of low-income pregnant women interacted within last year	96.6 (172.5)

Abbreviations: NFP, Nurse–Family Partnership; SD, standard deviation.

*Snowball sampling is a sampling technique where existing study participants tell other potentially suitable participants about the study. If they are interested and meet study criteria, they too can take part in it.

implementation in Hamilton and so were able to provide rich, contextual information. The participants had worked at their respective agency (3 from CAS and 1 from HPHS) for a mean (standard deviation) of 19 (6) years and in their current role for a mean of 12 (4) years. Participants had either a Bachelor of Social Work (n = 2) or a Master of Social Work (n = 2).

Data collection

We obtained written informed consent prior to each interview. Data were collected using individual, semi-structured, digitally recorded interviews that lasted approximately 60 minutes. To gain a deeper appreciation and understanding of the experiences and perspectives of the community professionals, the interview guide was developed from (but not limited to) the themes identified in Phase I (see Table 2; interview guides available from the authors on request). Data analysis and collection occurred concurrently and questions were modified in the interview guide to allow for better capture of themes.

Data management

Once transcribed, we de-identified the interviews and imported them into NVivo 10 (QSR International Pty Ltd; Doncaster, VC).[26] The use of NVivo also allowed the research process to be carefully tracked, which enhanced the auditability and credibility of the findings.

Data analysis

To the best of our knowledge, no previous studies had explored the factors that influence the acceptability of an early intervention program among health care and social service providers. We used inductive, conventional content analysis on the qualitative data from Phases I and II, and named the emergent codes based on the information shared by the study participants; we did not impose preconceived categories or theoretical perspectives on the data. We grounded the participants' unique perspectives, as generated by this conventional approach, in actual data.[27]

In Phase I, data analysis began with open coding, which involved highlighting the words in the transcript that captured participants' salient thoughts about the acceptability of the NFP home-visit program. Next, codes (essentially, labels assigned to segments of text to provide meaning) emerged. We constructed a list of preliminary codes by open coding 5 transcripts, and then developed a codebook as a guide for coding the subsequent interviews. This codebook was revisited and refined as new codes and concepts emerged from coding subsequent transcripts. Some categories were combined and others split into subcategories based on how different codes were related and linked. Themes emerged from the underlying meaning of the categories.

We followed similar methods for analyzing Phase II data. Specifically, we used the codes developed from Phase I to begin the analysis for Phase II and expanded the codebook as new codes and concepts emerged.

We applied the four strategies recommended by Lincoln and Guba[28]—credibility, transferability, dependability and confirmability—to ensure study rigour. We achieved credibility through peer debriefing and member checking. A second coder (MT) coded a subset of transcripts (four from Phase I and one from Phase II) and we compared these codes with those of the primary coder to achieve dependability. To obtain transferability, we described the research context and participant characteristics in detail. Maintaining an audit trail and field notes achieved confirmability was through.

The Hamilton Integrated Research Ethics Board approved the study.

Results

Phase I consisted of a secondary analysis of the individual interviews conducted with community health care and social service providers. We identified three main themes in Phase I: (1) the NFP as an evidence-based, structured education program for first-time mothers; (2) the NFP in partnership with other community agencies; and (3) the NFP in a community context (Table 2).

We continued to explore these themes in Phase II through interviews with HPHS and local CAS agency professionals with a significant amount of experience and knowledge of collaborating with NFP PHNs, supervisors and clients.

The NFP as an evidence-based, structured education program for first-time mothers

The health care and social service providers we interviewed saw the NFP as filling

TABLE 2
Phase I themes, categories and codes

Theme	Category	Codes
NFP as an evidence-based, structured education program for first-time mothers	NFP elements	Program structure and intensity NFP as an evidence-based intervention Preparing clients for motherhood
	Role of PHNs	PHN–client relationship as crucial aspect of NFP PHNs' expertise and professional image
NFP in partnership with other community agencies		PHNs as a direct connection to community services for clients Integral role of community support for NFP to continue and thrive
	Collaboration between agencies and NFP	Preference for further collaboration with NFP Preference for constant communication with NFP PHNs
NFP in a community context	Impact of NFP	Serving and supporting a needs gap Issue with duplication of services with existing community services Child protection services

Abbreviations: NFP, Nurse–Family Partnership; PHN, public health nurse.

an important gap in service for low-income, first-time mothers in Hamilton, Ontario. The interviewees unanimously expressed appreciation for the program's structure, its intensity in preparing clients for motherhood, its strong foundation of evidence, the expertise that PHNs brought to the home-visit program, and the close relationship built between each client and her PHN.

NFP elements

The interviewees noted the following unique aspects of the NFP: home visits start early in pregnancy; nurses visit frequently; and families remain enrolled in the program until the child's second birthday. Further, the interviewees considered the clear, defined goals for each visit, as laid out in the structured guidelines, a key strength and a unique characteristic of the NFP compared with other home-visit programs in the community. During each home visit, PHNs discuss topics related to six core content domains: personal health, environmental health, maternal role, life course development, family and friends, and health and human services. The interviewees also noted the program's tendency to encourage positive parent–child relationships and support the development of strong parenting skills while achieving the optimal balance in program intensity and frequency of scheduled home visits. One of the frontline care providers in a maternity home commented:

> My favourite part of it is *how intense* it is and how it *starts early in the pregnancy.* You know I think it gets expectant mothers starting to think about parenting and all that kind of stuff … And I also like that after the birth of the baby they visit once a week for 6 weeks … because that's … sort of a high-risk time, so I think that's a good component—and the fact that it goes for 2 years too … So it's very intense, I guess. (S523)

Agency leaders and frontline care providers were also positive about the strength of the outcomes associated with client participation in the NFP. They acknowledged that this participation is an important evidence-based intervention. Overall, participants were aware of the evidence from the United States, including the results from the NFP replications. A CAS professional said:

> As far as this particular program goes, I've been pretty impressed … obviously the results that they've seen in the US in terms of long-term impact and outcomes … that was very impressive to look at. (S509)

The participants in this study described the NFP as very beneficial to low-income, first-time mothers. By establishing the relationship with the client before the baby is born, PHNs were considered to be in the optimum position to address the risk factors known to influence prenatal and infant health outcomes and to support the client in preparing for her new role as a parent. One of the frontline care providers reflected on the benefits of the educational components:

> Oh, the educational factor and the hands-on educational factors are really an enormous help to the girls … that is really important that somebody be there to help with those types of things … giving them … a chance to talk about some of the stresses that they're having in their life with regard to parenting or taking care of their child. (S521)

This also illustrates a core component of the NFP—the formation of a therapeutic relationship between the client and her PHN, particularly when a PHN becomes a client's go-to person for talking about stressors in her life. In addition to educating clients about health issues and teaching positive parenting skills, PHNs play a key role in empowering clients by boosting their confidence and self-esteem and by introducing positive, productive activities in their life.

The role of PHNs

Participants saw the regular one-on-one interactions between the PHN and the client as essential to establishing a trusting, long-term relationship, one that could last up to 2.5 years. As one social worker elaborated:

> I think it's definitely somebody that they can feel confident in calling whenever they have a question or a concern … it's my understanding that the clients have their [PHNs'] cell phone numbers. You don't get that very often that you can just pick up the phone and just get a hold of somebody who's in the medical field *right away* … I think young mothers need to have somebody who they can feel confident and trust in that way. (S511)

The participants all agreed that PHNs brought specific knowledge and expertise on health issues to the clients in the NFP. They perceived PHNs as having a good reputation and a more positive image than that of other community professionals who work with young, low-income mothers, including social workers, CAS workers or parent support workers. One social worker contrasted the public images of PHNs versus that of social workers and CAS professionals:

> I think that you know people often get their anxieties heightened when they know … if they know it's a social worker. I can often sell a program easier if I say it's voluntary, it's a nurse who visits all walks of life, it's not somebody who's coming to "check up on you." Whereas people feel that if it's a Children's Aid worker or parent support worker that that's kinda more the case. (S511)

The NFP in partnership with other community agencies

PHN as a direct connection to community services for clients

The community care providers perceived PHNs as a direct connection to those community services that offer support to young, low-income mothers. These include supports for housing, schooling or health care. Care providers emphasized the importance for programs to be collaborative and pointed out the value of a bidirectional approach to promoting community services.

The participants also described the integral role of community support for the NFP to continue and thrive. One of the social service providers suggested that the NFP needs to be part of a continuum of support for high-risk mothers as their problems with housing and employment as well as any mental health issues may not have entirely resolved upon

graduation from the NFP. As such, the NFP is in a position to prepare the other agencies that would continue or begin to provide support to these young mothers. This suggests that further collaboration between the NFP and other community agencies to form a concrete, supportive infrastructure for this targeted population is in order. One of the community care providers discussed collaboration as a means to prevent duplication of services for the clients. She described:

> So it's just a matter of *connecting* and, you know, *collaborating* so that you're not duplicating. And I think that's what's really important and that's what I try to do when, when I ... when there was a number of different agencies, specifically if there's a Nurse–Family Partnership ... let's pull everyone together ... (S519)

Preference for constant communication with NFP PHNs

The care providers emphasized the potential benefits of more communication with NFP PHNs, including better referrals and the capacity for enhanced community support for the NFP, as well as greater awareness of the goals that the NFP is trying to achieve. One of the community care providers suggested that planning meetings with the NFP would help them keep up-to-date with the NFP's progress within the community, which could, in turn, help their agency support the NFP more effectively, particularly around referrals:

> I think meetings every once in a while to keep us up-to-date, to let us know what's happening so that we can support the program. So that ... it's you know the ... what happens is if you know what something is you can refer it a whole lot better. (S503)

The NFP in a community context

The NFP was thought to positively impact the community agencies without interfering with the logistics of existing services. The community care providers felt that the NFP filled a gap for first-time disadvantaged young mothers in Hamilton. Many of the providers also commented on the impact the NFP had on child protection services, for example, closing CAS cases earlier, reducing the number of CAS files being opened and enhancing the process of safety planning with high-risk families. Some providers raised concerns about duplicating services with existing agencies, and some compared the HPHC with the NFP.

Impact of NFP on existing services within community

When participants were asked how the NFP affected their existing services, all of them reported that the NFP did not interfere with the logistics of how they provide their services; rather, the NFP augmented the services they provided to first-time mothers. They acknowledged the positive impact of PHNs on their services, both directly and indirectly (through the clients). As one physician related:

> Yeah, I was very excited about it and, from my perspective as a family doc, it saves me time and I know that I can hook up my patient with resources that hopefully will be able to help her keep a baby and be a better mother ... The reality is no family doc, no matter how much they care about their patients, has the *time* to do what the nurses are doing—I'll be perfectly honest. (S514)

Impact of the NFP on child protection services

Many of the participants commented on the impact that the NFP had on child protection services (specifically CAS). This aspect warrants a separate description of findings from other existing community services. CAS workers reported feeling more confident when another health care professional was also working closely with their clients. CAS workers also commented that they trusted that PHNs would communicate any concerns with the client to the CAS. Another participant considered NFP as "more intense work" and felt "more confident closing the [CAS] file" when the PHN was visiting the client regularly. This participant further elaborated:

> I don't know how this particular case would have went [sic] if I didn't have that other person [the PHN] to help facilitate the meetings that we had, to help be another person that was having eyes on the situation, and also in terms of giving me the information [about what] was actually what was going on, right? So I think definitely it helped to just give me a clearer picture and to make my planning easier, and to provide a better situation and plan for the baby and for the mother. (S515)

CAS professionals valued working with NFP PHNs for a common client, and often described their positive experiences and the helpful support they received from the PHNs. Some barriers to a seamless collaboration did exist, however. One CAS professional recounted her experience with a PHN when they worked "side by side together." She elaborated on the challenges of understanding each other's roles; specifically, when her role as a CAS worker changed after a child was found in need of protection (according to the Ontario Child and Family Services Act[29]) and the CAS had to intervene and implement specific services for the client:

> There was a couple of times, I have to be honest, where it was ... I didn't know if it was because she didn't understand our role and maybe I didn't understand her role as much as we needed to, to work more together ... when the baby is born and it becomes a *protection* file ... there's then child safety and protection concerns. So *our role changes*. So when I worked with the (NFP PHN) with this mother before the baby was born, it was a lot different and easier as far as following her ... But once it became protection I had to intervene. I had to put services that the Society has in place for this mother because it became protection and there were concerns ... (S516)

Synthesis of results

Integrating the results from the first and second phases of this study gave us the opportunity to further explore findings that emerged from the secondary data analysis and to answer some of the remaining questions. Findings from the second phase of the study (which reflected current perceptions on NFP delivery) were largely consistent with those from the first (perspectives dated back to 2009; Table 3 summarizes the

TABLE 3
Summary of findings consistent in both Phases I and II interviews

Theme	Summary
NFP as an evidence-based, structured education program for first-time mothers	Participants described the positive feedback from clients about the NFP. Young mothers appear to be very satisfied with the program's deliverables. The idea of establishing a long-term relationship with family is still viewed as the main component of the NFP. Participants spoke about the benefits that the NFP gives to the mother and child. The need for interpretation services to better screen young mothers still exists.
NFP in partnership with other community agencies	Participants suggested more communication and how to frequently share information (e.g., inviting PHNs to visit the agencies to educate staff on first-time, young mothers and their experiences with them, or provide quick updates via phone).
NFP's relationship with community agencies	PHNs are considered an important resource for connecting their clients to community services. NFP involvement gives CAS workers confidence in closing cases. PHNs play an integral role in the development of the safety plan with CAS workers and family.

Abbreviations: NFP, Nurse–Family Partnership; PHN, public health nurse.

major findings that were consistent between the two phases). Nonetheless, data from Phase II added to the information on the current status of NFP, particularly to those areas that needed further exploration, and told us about the current challenges faced by the NFP (see Table 4).

Discussion

The results provide valuable insights into the acceptability of the NFP in a Canadian community. These perspectives from community health and social care providers confirm and support the experiences of young, disadvantaged first-time mothers who participated in the NFP in Hamilton, Ontario.[28] Specifically, mothers in the program considered the PHNs as credible health experts as well as supportive friends whom they could trust and confide in. In addition, mothers in the case study recognized the empowering relationship they had with the PHNs and considered them advocates when dealing with community agencies.

After almost six years of working with the NFP in Hamilton, CAS professionals and PHNs appear to have adopted several of the strategies suggested by care providers in Phase I to promote interorganizational collaboration. These strategies include (1) outlining the responsibilities of the CAS worker and the PHN at the start of the working relationship; (2) clearly delineating and communicating each professional's goals to do with working with the family; and (3) organizing meetings with the family to discuss ways to enhance their support. Interorganizational collaboration is considered one of the strategies that prevent duplication in services.[31]

In Phase I, community care providers also expressed the view that it was initially challenging to differentiate between existing maternity home services and the NFP. After working with NFP PHNs, the providers came to appreciate the NFP approach, which focusses its child development–based foundation on young, disadvantaged, first-time mothers. In Phase II, it was revealed that the NFP team members have put significant effort in helping community partners understand the NFP recommendations and goals by holding meetings with decision makers at the provincial level and with other community stakeholders. The NFP also promoted collaboration with other organizations by forming interorganizational alliances, for example, through coordinating councils or community advisory boards where leaders and/or direct care providers can set common goals.[32] Establishing a community advisory board is one of the 18 core model elements of the NFP that agencies agree to implement as part of their contract with the program.[14]

Our findings revealed that the NFP, a long-anticipated, effective intervention targeting high-risk, first-time mothers in Hamilton, is recognized as filling an important gap in service. Health care and social service professionals in this study saw partnership as the key to the NFP's success and sustainability in the community. This finding is in line with reviews that report more robust outcomes when home-visit programs partner with other early intervention services and community support programs.[17] Disadvantaged families accessing early childhood services often have complex needs that cannot be adequately addressed by a single service such as home visiting and, as such, community services need to work together to target these unmet needs.[20]

The health care and social service professionals we interviewed in this study also pointed out how crucial it is to continue to provide support for clients after they

TABLE 4
New findings and concepts from Phase II

Theme	Summary	Type of information
NFP relationship with community agencies	Currently, a major challenge to referral is the long waiting list for eligible mothers to participate in the program.	New information
NFP in the community context	A PHN's knowledge and observations on the family is considered a crucial component to providing the most accurate information on the family's status to CAS.	Further explored
	Due to cutbacks in various CAS home-visit services, it relieves the pressure from an influx of CAS referrals because a portion of these cases can also be referred to the NFP.	New information

Abbreviations: NFP, Nurse–Family Partnership; PHN, public health nurse.

graduate from the NFP so that they reach their full potential as parents. This finding is supported by a brief report on the Family-Nurse Partnership in Scotland.[33]

Study strengths and limitations

Our study had several strengths. We used multiple strategies, such as member checking, double coding and use of an audit trail, to ensure methodological rigour. Further, the Phase I sample size (n = 24) allowed for saturation and for themes to emerge. The implementation of a two-phase study design addressed the inherent challenges of secondary data analyses: 1) the re-analysis of data, which may not adequately reflect the new research questions; and 2) data from the original study may be bound by time and scope.[25] The categories and themes derived from the first phase (secondary analysis of individual interviews) served as a guide for developing interview questions for the second phase of the study.

There were also some important limitations, particularly with regard to sampling for Phase II. The sample for this phase was extremely small (n = 4), and saturation for additional themes could not be reached with the new data. Although it is not possible to reach any firm conclusions because of the very limited sample size in Phase II, we did identify some unique concepts that warrant further exploration. Expanding the number of clients interviewed in Phase II to include more health care and social service providers who are connected with the NFP would have enhanced the transferability of findings from this study. Triangulation, which involves using different methods or data sources for data collection and/or analysis, for example, through focus groups or other data sources such as newsletters or meeting minutes,[28] would also have been useful.

Future research considerations

Nurse home visits have been a critical component of public health for over a century. Although much is known about the importance of the therapeutic relationship between the nurse, the client and her family, no studies to date have examined the relationship between nurse home visitors and community care providers. Our findings suggest that closer exploration of the role of social service and health care providers within the context of home visitation is important in understanding approaches to service provision and implementation.

Implications

The data collected through individual interviews provides insight into the key components required to enhance the success of integrating a long-term home-visit program into an existing network of community services. Such findings are important considerations in examining the effectiveness of the intervention. Currently, an RCT is underway in British Columbia as the next phase of NFP implementation in Canada. Our study has identified the need to establish stronger collaborations with community agencies, and to consider how their specific roles overlap.

Conclusion

Health care and social service providers recognized the added value of the NFP to existing community services for disadvantaged first-time mothers. PHNs who delivered the NFP intervention were seen as playing a key part in connecting these mothers to community services, preparing them for motherhood, and preventing or ending the involvement of child protection services. Care providers also looked to collaborating with the NFP to form an integrated network of services that make transitions between services as seamless as possible.

This is the first qualitative study to explore the acceptability of a long-term home-visit program from the perspective of health care and social service providers within a community. It would be useful to examine the perceptions of care providers about the ongoing implementation of the NFP and the extent to which it is seen as meeting the needs of the community.

Acknowledgments

Funding for the original research was received from the Nursing Research Fund, Ontario Ministry of Health and Long-Term Care and from the Provincial Centre of Excellence for Child and Youth Mental Health at the Children's Hospital of Eastern Ontario. We are grateful to the community care providers who participated in the original study (Phase I) and those who were interviewed for this study (Phase II). Dr. Harriet MacMillan is supported by the Chedoke Health Chair in Child Psychiatry. Special thanks to Dr. Masako Tanaka for her role as second coder to help achieve intercoder agreement.

References

1. McCormick MC, Brooks-Gunn J, Shorter T, Holmes JH, Wallace CY, Heagerty MC. Factors associated with smoking in low-income pregnant women in relationship to birth-weight, stressful life events, social support, health behaviors and mental distress. J Clin Epidemiol. 1990;43(5):441-8.

2. Sable MR, Wilkinson DS. Impact of perceived stress, major life events and pregnancy attitudes on low birth weight. Fam Plann Perspect. 2000;32:288-94.

3. Issel LM, Forrestal SG, Slaughter J, Wiencrot A, Handler A. A review of prenatal home-visiting effectiveness for improving birth outcomes. J Obstet Gynecol Neonatal Nurs. 2001;40(2):157-65.

4. Gomby DS, Larson CS, Lewit EM, Berman RE. Home visiting: analysis and recommendations. Future Child. 1993;3(3):6-22.

5. Gates R, Nickel D, Muhajarine N. Evaluation Research Team. The effectiveness of home visitation interventions similar to KidsFirst, Saskatchewan: a focused literature review [Internet]. Saskatoon (SK): Early Learning and Child Care Branch, Saskatchewan Ministry of Education; 2010 [cited 2014 June 23]. Available from: http://kidskan.ca/wp-content/uploads/2013/05/3a-Home-Visiting-Lit-Review-KidsFirst-Evaluation-2009.pdf

6. Bronfenbrenner U. Ecology of human development: experiments by nature and design. Cambridge (MA): Harvard University Press; 1979.

7. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychol Rev. 1977;84(2):191-215.

8. Bowlby J. Attachment and loss: Attachment. London (UK): Hogarth Press and the Institute of Psycho-Analysis; 1969.

9. Olds DL, Eckenrode J, Henderson CR, et al. Long-term effects of home visitation on maternal life course and child abuse and neglect. Fifteen-year follow-up of a randomized trial. JAMA. 1997;278(8):637-43.

10. Olds D, Robinson J, Pettit L, et al. Effects of home visits by paraprofessionals and by nurses: age 4 follow-up results of a randomized trial. Pediatrics. 2004;114(6) 1560-8.

11. Olds DL, Kitzman H, Cole RE, Hanks CA, Arcoleo KJ, Anson EA, et al. Enduring effects of prenatal and infancy home visiting by nurses on maternal life course and government spending: follow-up of a randomized trial among children at age 12 years. Arch Pediatr Adolesc Med. 2010;164(5): 419-24.

12. Gomby DS. Home visitation in 2005: outcomes for children and parents. Invest in Kids working paper no. 7 [Internet]. Washington (DC): 2005 [cited 2014 May 2]. Available from wvpartners.org/docs/report_ivk_gomby_2005.pdf

13. Howard KS, Brooks-Gunn J. The role of home-visiting programs in preventing child abuse and neglect. Future Child. 2009;19(2) 119-46.

14. Nurse-Family Partnership. Implementation overview & planning: a guide for prospective Nurse-Family Partnership implementing agencies [Internet]. Denver (CO): Nurse-Family Partnership; 2010 [cited 2014 May 2]. Available from: http://www.nursefamilypartnership.org/assets/PDF/Policy/HV-Funding-Guidance/NFP_Overview_Planning

15. Nurse-Family Partnership. Pregnancy assistances for first-time moms [Internet]. Denver (CO): Nurse-Family Partnership; 2011 [cited 2014 Jun 15]. Available from: http://www.nursefamilypartnership.org/first-time-moms

16. Hicks D, Larson C, Nelson C, Olds DL, Johnston E. The influence of collaboration on program outcomes: The Colorado Nurse-Family Partnership. Eval Rev. 2008;32(5):453-77.

17. Daro D. Home visitation: assessing progress, managing expectations [Internet]. Chicago (IL): Ounce of Prevention Fund: 2006 [cited 2014 May 2]. Joint publication of the Chapin Hall Center for Children. Available from: http://www.chapinhall.org/sites/default/files/old_reports/323.pdf

18. Daro D, Cohn-Donnelly A, editors. Child abuse prevention: accomplishments and challenges. APSAC handbook on child maltreatment. 2nd ed. Newbury Park (CA): SAGE Publications; 2001.

19. Schumacher R, Hamm K, Goldstein A, Lonbardi J. Starting off right: promoting child development from birth in state early care and education initiatives [Internet]. Washington (DC): Centre for Law and Social Policy; 2006 [cited 2014 May 2]. Available from: http://www.clasp.org/publications/startingoffright.html

20. Council on Child and Adolescent Health. The role of home-visitation programs in improving health outcomes for children and families. Pediatrics. 1998;123(2):486-9.

21. Jack SM, Busser D, Sheehan D, Gonzalez A, Zwygers EJ, MacMillan HL. Adaptation and implementation of the Nurse-Family Partnership in Canada. Can J Public Health. 2012;103(7):eS42-8.

22. Jack SM, MacMillan HL. Adaptation and evaluation of the Nurse-Family Partnership in Canada [Internet]. The Hague (ND): Early Childhood Matters; 2014 [cited 2014 Jun 15]. Available from: http://earlychildhoodmagazine.org/adaptation-and-evaluation-of-the-nurse-family-partnership-in-canada/

23. Dmytryshyn AL, Jack SM, Ballantyne M, Wahoush O, MacMillan HL. Long-term home visiting with vulnerable young mothers: an interpretive description of the impact on public health nurses. BMC Nursing. 2015;14:12. doi:10.1186/s12912-015-0061-2.

24. Landy CK, Jack SM, Wahoush O, Sheehan D. MacMillan HL; NFP Hamilton Research Team. Mothers' experiences in the Nurse-Family Partnership program: A qualitative case study. BMC Nursing. 2012;11:15. doi:10.1186/1472-6955-11-15.

25. Rew L, Koniak-Griffin D, Lewis MA, Miles M, O'Sullivan A. Secondary data analysis: new perspective for adolescent research. Nurs Outlook.2000;48(5):223-9.

26. NVivo qualitative data analysis software, version 10. Doncaster (VC): QSR International Pty Ltd; 2013.

27. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. Qual Health Res. 2005;15(9):1277-88.

28. Lincoln YS, Guba EG. Naturalistic inquiry. Newbury Park (CA): SAGE Publications; 2005.

29. Child and Family Services Act, RSO 1990, c C.11 [Internet]. Available from: http://canlii.ca/t/ldxd

30. Landy CK, Jack SM, Wahoush O, Sheehan D, MacMillan HL. NFP Hamilton Research Team. Mothers' experiences in the Nurse-Family Partnership program: A qualitative case study. BMC Nurs. 2012;11:15.

31. Peterson N. Interagency collaboration under Part H: the key to comprehensive, multidisciplinary, coordinated infant/toddler intervention. J Early Interv. 2003;15(1):89-105.

32. Foster-Fishman PG, Salem DA, Allen NA, Fahrbach K. Facilitating interorganizational collaboration: the contributions of interorganizational alliances. Am J Community Psychol. 2001;29(6):875-905.

33. Trotter G. Family Nurse Partnership programme in Scotland: an update [Internet]. Community Pract. 2012 [cited 2014 Jun 15]. Available from: http://www.readperiodicals.com/201208/2731312821.html

Commentary

Adapting and retesting evidence-based child maltreatment prevention programs: a case study in Canada

Christopher Mikton, PhD

Tweet this article

This special issue of *Health Promotion and Chronic Disease Prevention in Canada* is timely, as child maltreatment is a significant public health problem; globally, the number affected is at least in the hundreds of millions. One-quarter of adults report having been physically abused and over one-third emotionally abused as children; one in 5 women and one in 13 men report having been sexually abused.[1-3] Recent national surveys of violence against children conducted in Africa and in other low- and middle-income countries reveal rates of childhood physical, sexual and emotional abuse even higher than the global rates.[4]

> "Imagine," Dr James Mercy, Director of the Violence Prevention Division at the US Centers for Disease Control and Prevention[5] (US-CDC) suggests, "that you woke up this morning and newspaper headlines said that scientists had discovered a new disease. The scientists reported that up to 1 billion children worldwide were exposed to this disease every year. And that over the course of their lifetimes children exposed to this disease were at greater risk for mental illnesses like depression and anxiety disorders; at greater risk for chronic diseases such as diabetes, heart disease, and cancer; at greater risk of infectious diseases like HIV; and, if that wasn't enough, at greater risk for involvement in social problems like crime and drug abuse. If we had such a disease, what do you think we'd do? The truth is we do have such a "disease"; it's violence against children."

Several organizations, including US-CDC, the World Health Organization, the United Nations Children's Fund and the Public Health Agency of Canada, to name but a few, have identified child maltreatment prevention as a global health priority and have supported efforts to take sustained and effective action to prevent it.

But there is a major obstacle. Currently, strategies to prevent child maltreatment that are both demonstrably effective and scalable to the national population are rare.

The Nurse–Family Partnership (NFP) is one of the few.

The NFP was developed in the United States, and the three randomized controlled trials that demonstrated its effectiveness at preventing child maltreatment (by almost one-half) and many other negative outcomes have all been conducted in the US. As this special issue rightly emphasizes, and as the literature of cross-cultural adaptation of evidence-based interventions makes clear,[6-8] we cannot assume that the NFP will produce the same impressive results when implemented elsewhere, and it is necessary for it to undergo a careful process of adaptation, retesting and refining to ensure it remains effective. Canada is making a concerted—and exemplary—effort to this effect.

Jack et al.[9] describe the rigorous process of initial adaptation, feasibility assessment and acceptability the NFP is undergoing in Ontario and British Columbia. Perceptions of the health care and social service professionals involved in referrals to the NFP and who provide services to NFP families is the focus of the paper by Li et al.[10] These researchers address the critical challenge of integrating NFP into an existing network of services. Hovdestad et al.[11] examine whether it is the youngest mothers—whom the NFP usually targets—whose children are at highest risk of negative outcomes.

Jack et al.[9] describe a process of adaptation and re-evaluation that goes beyond the four-step model required by Dr. David Olds, the program developer, and his staff at the Prevention Research Center at the University of Colorado Denver[12] They included an additional process evaluation and a study examining potential biological mechanisms linking the intervention and the behavioural outcomes in children. This augmented process will thus include six phases: (1) adaptation; (2) assessment of feasibility and acceptability; (3) a randomized controlled trial to evaluate effectiveness; (4) a process evaluation; (5) a study of potential biological mechanisms; and (6) replication and expansion. The rigour of the process and the fact that it is being so carefully documented, through these papers among other means, will contribute to developing an empirically validated method for the cross-country and cross-cultural adaptation of child maltreatment prevention programs.[13-15]

Jack et al.[9] raise some difficult questions concerning the process of cross-cultural and

Author reference:

Prevention of Violence (PVI), Management of Noncommunicable Diseases, Disability, Violence and Injury Prevention (NVI), Noncommunicable Diseases and Mental Health, World Health Organization, 20 Avenue Appia, CH-1211 Geneva 27, Switzerland

Correspondence: Christopher Mikton, World Health Organization, 20 Avenue Appia, CH-1211 Geneva 27, Switzerland; Email: miktonc@who.int

cross-context adaptation and evaluation. These questions are likely to become starker as the NFP and similar interventions are implemented in lower-resource countries that are culturally distant from the countries that developed the interventions. There is a consensus among the different models and frameworks for cross-cultural and cross-context adaptation that it is critical to maintain fidelity to the essential—or causally effective—components of the intervention so that it preserves its effectiveness in the new setting.[7,16-19] To do so, however, requires these components be empirically identified through methods such as decomposing trials, mediational analyses and micro-trials.[20] The extent to which the 18 model elements specified by the NFP are causally effective and how faithfully they each have to be implemented before the intervention begins to lose its effectiveness remain unclear.[21]

The study by Li et al.[10] points to one such possible essential ingredient, the one-to-one and long-term "therapeutic" relationship between the public health nurse and the client. This study highlights the credibility of the evidence-base supporting the NFP in the eyes of health care and social service professionals and the perception that, even in a high-resource setting such as Canada, NFP is filling a major gap. Li et al.[10] also ask to what extent the effectiveness—particularly the long-term effectiveness—of the NFP depends on the quality of, and degree of integration with, services provided in parallel to and after the mothers have completed the NFP. In lower-resource settings with fewer nurses, the feasibility of sustaining an expensive stand-alone intervention such as NFP might be a challenge, making the identification of key ingredients and the integration, in the long term, of these ingredients into standard service delivery all the more important.

Using a sample of mothers from the Canadian Incidence Study of Reported Child Abuse and Neglect, Hovdestad et al.[11] found that mothers under 22 years of age are generally at higher risk for poor child health and developmental outcomes than those who are older. In particular, they identify higher rates of modifiable risk factors, such as receiving social assistance, alcohol abuse, or lack of social support, in this population. This provides empirical confirmation that early childhood interventions, such as the NFP, should be targeting this population as a matter of priority. However, it will be important to consider whether younger mothers remain at higher risk in countries and cultures where giving birth at a young age is more normative. Such countries include Bangladesh, Ethiopia, Mexico and Nicaragua, where 40%, 22%, 39%, 28%, respectively, of women have given birth by the age of 18 years.[22]

This careful process of adaptation and retesting of the NFP underway in Canada holds great promise for the field of child maltreatment prevention globally. It is hoped that this process will contribute to developing empirically based methods for cross-country and cross-cultural adaptation and validation, which are currently sorely lacking and, without which, it is unlikely that evidence-based interventions can ever sufficiently expand globally to prevent this "disease"—one that affects hundreds of millions of children around the world.

References

1. Stoltenborgh M, Bakermans-Kranenburg MJ, Alink LR, Van IM. The university of childhood emotional abuse: a meta-analysis of worldwide prevalence. J Aggress Maltreat Trauma. 2012;21(8):870-90. DOI: 10.1080/10926771.2012.708014.

2. Stoltenborgh M, Bakermans-Kranenburg MJ, Ijzendoorn MJ, Alink LRA. Cultural-geographical differences in the occurrence of child physical abuse? A meta-analysis of global prevalence. Int J Psychol. 2013;48(2):81-94. DOI: 10.1080/00207594.2012.697165.

3. Stoltenborgh M, Van IM, Euser EM, Bakermans-Kranenburg MJ. A global perspective on child sexual abuse: meta analysis of prevalence around the world. Child Maltreat. 2011;16(2):79-101. DOI: 10.1177/1077559511403920.

4. Injury Prevention & Control: Division of Violence Prevention. Towards a violence-free generation: using science to fuel action and end violence against children [Internet]. Atlanta (GA): US Centers for Disease Control and Prevention; 2015 [cited 2015 May 1]. Available from: http://www.cdc.gov/violenceprevention/vacs/index.html

5. Mercy J. CDC measures violence against children, sparks action [Internet]. Atlanta (GA): CDC Foundation; 2013 Nov 25 [cited 2015 May 1]. Available from: http://www.cdcfoundation.org/blog-entry/cdc-measures-violence-against-children-sparks-action

6. Barrera M Jr, Castro FG, Steiker LK. Critical analysis of approaches to the development of preventive interventions for subcultural groups. Am J Community Psychol. 2011;48(3-4):439-54. DOI: 10.1007/s10464-010-9422-x.

7. Cuijpers P, de Graaf I, Bohlmeijer E. Adapting and disseminating effective public health interventions in another country: towards a systematic approach. Eur J Public Health. 2005;15(2):166-9. DOI: 10.1093/eurpub/cki124.

8. United Nations Office on Drugs and Crime. Guide to implementing family skills training programmes for drug abuse prevention [Internet]. New York: United Nations; 2009 Feb [cited 2015 May 1]. Available from: http://www.unodc.org/documents/prevention/family-guidelines-E.pdf

9. Jack SM, Catherine N, Gonzalez A, MacMillan HL, Sheehan HD, Waddell C, For the British Columbia Healthy Connections Project Scientific Team. Adapting, piloting and evaluating complex public health interventions: lessons learned from the Nurse–Family Partnership in Canadian public health settings. Health Promo Chronic Dis Prev Can. 2015;35(8/9):151-9.

10. Li SA, Jack SM, Gonzalez A, Duku E, MacMillan H. Health care and social service professionals' perceptions of a home-visit program for young, first-time mothers. Health Promot Chronic Dis Prev Can. 2015;35(8/9):160-7.

11. Hovdestad W, Shields M, Williams G, Tonmyr L. Vulnerability within families headed by teen and young adult mothers investigated by child welfare services in Canada. Health Promot Chronic Dis Prev Can. 2015;35(8/9):143-50.

12. Prevention Research Center for Family and Child Health. Nurse-Family Partnership international program [Internet]. Denver (CO): University of Colorado Denver; [cited 2014 Dec 4].

13. Castro FG, Barrera M Jr, Steiker LKH. Issues and challenges in the design of culturally adapted evidence-based interventions. Annu Rev Clin Psychol. 2010;6:213-39. DOI:10.1146/annurev-clinpsy-033109-132032.

14. Lau AS. Making the case for selective and directed cultural adaptations of evidence-based treatments: Examples from parent training. Clin Psychol-Sci Pr. 2006;13(4):295-310. DOI: 10.1111/j.1468-2850.2006.00042.x.

15. Mikton C. Two challenges to importing evidence-based child maltreatment prevention programs developed in high-income countries to low-and middle income countries: generalizability and affordability. In: H. Dubowitz, editor. World Perspectives on Child Abuse. 10th edition. Aurora (CO): International Society for the Prevention of Child Abuse and Neglect; 2012.

16. Falicov CJ. Commentary: On the wisdom and challenges of culturally attuned treatments for Latinos. Fam Process. 2009;48(2):292-309. DOI: 10.1111/j.1545-5300.2009.01282.x.

17. Leerlooijer J, Ruiter RA, Reinders J, Darwisyah W, Kok G, Bartholomew L. The World Starts With Me: using intervention mapping for the systematic adaptation and transfer of school-based sexuality education from Uganda to Indonesia. Transl Behav Med. 2011;1(2): 331-40. DOI:10.1007/s13142-011-0041-3.

18. Wingwood GM, Diclemente RJ. The ADAPT-ITT model: a novel method of adapting evidence-based HIV interventions. J Acquir Immune Defic Syndr. 2008;47: S40-6. DOI:10.1097/QAI.0b013e3181605.

19. Kumpfer KL, Pinyuchon M, Teixeiria DMA, Whiteside HO. Cultural adaptation process for international dissemination of the Strengthening Families Program. Eval Health Prof. 2008;31(2):226-39. DOI: 10.1177/0163278708315926.

20. Leijten P, Dishion TJ, Thomaes S, Raaijmakers MA, de Castro BO, Matthys W. Bringing parenting interventions back to the future: how randomized microtrials may benefit parenting intervention efficacy. Clin Psychol. 2015;22(1):47-57. DOI: 10.1111/cpsp.12087.

21. Nurse-Family Partnership. Nurse-Family Partnership model elements [Internet]. Denver (CO): Nurse-Family Partnership; 2011 [cited 2015 May 1]. Available from: http://www.nursefamilypartnership.org/communities/model-elements

22. Statistics and monitoring. Country statistics [Internet]. New York: UNICEF; 2015 [cited 2015 May1]; Available from: http://www.unicef.org/statistics/index_countrystats.html

Other PHAC publications

Researchers from the Public Health Agency of Canada also contribute to work published in other journals. Look for the following articles published in 2014 and 2015:

Afifi TO, Taillieu T, Cheung K, Katz LY, **Tonmyr L**, et al. Substantiated reports of child maltreatment from the Canadian incidence study of reported child abuse and neglect 2008: examining child and household characteristics and child functional impairment. Can J Psychiatry. 2015;60(7):315-23.

Danaei G, Fahimi S, Lu Y, [...] **Robitaille C**, [...] **Wang MD**, et al. Effects of diabetes definition on global surveillance of diabetes prevalence and diagnosis: a pooled analysis of 96 population-based studies with 331 288 participants. Lancet Diabetes Endocrinol. 2015;3(8):624-37.

Gao Z, Parhar A, **Gallant V**, et al. A population-based study of tuberculosis case fatality in Canada: do Aboriginal peoples fare less well? Int J Tuberc Lung Dis. 2015;19(7):772-9.

Higginbottom GMA, Morgan M, Alexandre M, Chiu Y, Forgeron J, **Kocay D**, et al. Immigrant women's experiences of maternity-care services in Canada: a systematic review using a narrative synthesis. Syst Rev. 2015;4(1).

Hovdestad W, Campeau A, Potter D, Tonmyr L. A systematic review of childhood maltreatment assessments in population-representative surveys since 1990. PLoS ONE. 2015;10(5):e0123366.

Kimber M, Henriksen CA, Davidov DM, Goldstein AL, Pitre NY, **Tonmyr L**, et al. The association between immigrant generational status, child maltreatment history and intimate partner violence (IPV): evidence from a nationally representative survey. Soc Psychiatry Psychiatr Epidemiol. 2015;50(7):1135-44.

Mitra D, Shaw A, Tjepkema M, Peters P. Social determinants of lung cancer incidence in Canada: a 13-year prospective study. Health Rep. 2015;26(6):12-20.

Mo F, Morrison H, Neutel IC. Population attributable risk from obesity to arthritis in the Canadian Population Health Longitudinal Survey 1994-2006. Int J Rheum Dis. 2014;17(6):628-34.

Ngoma MS, Misir A, Mutale W, Rampakakis E, Sampalis JS, Elong A, Chisele S, Mwale A, Mwansa JK, Mumba S, Chandwe M, **Pilon R, Sandstrom P**, et al. Efficacy of WHO recommendation for continued breastfeeding and maternal cART for prevention of perinatal and postnatal HIV transmission in Zambia. J Int AIDS Soc. 2015;18(1):19352.

O'Donnell S, Vanderloo S, McRae L, Onysko J, Patten SB, **Pelletier L**. Comparison of the estimated prevalence of mood and/or anxiety disorders in Canada between self-report and administrative data. Epidemiol Psychiatr Sci. 2015 Jun 17. [Epub ahead of print]

O'Donnell S, Rusu C, Hawker GA, Bernatsky S, **McRae L**, et al. Arthritis has an impact on the daily lives of Canadians young and old: results from a population-based survey. BMC Musculoskelet Disord. 2015;16:230.

Patterson AP, Booth SA, Saba R. The emerging use of in vivo optical imaging in the study of neurodegenerative diseases. BioMed Res Int. 2014;2014:401306.

Whyte HEA, Jefferies AL, Lacaze T, Newhook LA, Hendson L, Lemyre B, Narvey MR, Shah V, Sorokan S, Boisvert L, Gagnon A, Gagnon R, **León JA**, et al. The interfacility transport of critically ill newborns. Paediatr Child Health. 2015;20(5):265-9.

Yusa A, Berry P, Cheng JJ, **Ogden N**, et al. Climate change, drought and human health in Canada. Int J Environ Res Public Health. 2015;12(7):8359-412.

Zakaria D, Trudeau R, Sanmartin C, et al. Using personal health insurance numbers to link the Canadian cancer registry and the discharge abstract database. Health Rep. 2015;26(6):3-11.